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This is the User's Guide for HP Surestore DAT internal, external and removable (rack-mounted) tape drives and autoloaders. It describes how to use HP Surestore DAT tape drives and autoloaders.

To start, click on one of the above topics or select a topic from the navigation pane on the left. For example, click on **specifications** for a detailed description of the HP Surestore DAT tape drives and autoloaders.

Use the **index of topics** page to search for a particular topic.

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before you start

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- computer and backup software requirements
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pre-installation check list

Before you install your HP Surestore DAT drive:

1. Check that your computer meets the requirements for installation.
2. Make a note of the model name, product number, and serial number of your tape drive and record it on page 2 of the "Getting Started" guide.
3. Collect information about the SCSI configuration of your computer and any other devices attached to it and decide how you are going to configure the drive on the SCSI bus. If you are installing on a Windows NT 4, Windows 2000 or Novell NetWare system, you can use the HP Library & TapeTools software provided on the HP Surestore Tape CD-ROM to do this. If you are not familiar with how to configure a SCSI bus, you may also want to read the SCSI configuration information provided in this guide.
4. Select a free bay for an internal or a removable drive
   or
   Select a site for an external drive.

installation

The "Getting Started" guide provides detailed installation instructions.

Click below for a PDF version of the appropriate guide:

- HP Surestore DAT internal drives: Getting Started guide
- HP Surestore DAT internal autoloaders: Getting Started guide
- HP Surestore DAT external drives: Getting Started guide
- HP Surestore DAT external autoloaders: Getting Started guide

You need a copy of Adobe Acrobat Reader to read the PDF files. If you do not have this software, you can link to Adobe's web site to download a free copy.

how to identify your model

The tape drive or autoloader has its model name on the front panel and its product number and serial number on a label on its base, as shown below.

HP Surestore DAT 24 and DAT 24x6 models also have the DDS-3 logo on the front panel. HP Surestore DAT 40 and DAT 40x6 models have the DDS-4 logo on the front panel.

computer and backup software

The HP Surestore DAT drive has the following hardware and software requirements:

computer systems

If you are installing the tape drive on a UNIX system, refer to the UNIX instructions for further information about the systems supported and installation instructions.

For the latest list of operating systems that support HP Surestore DAT drives, please consult our World Wide Web site (www.hp.com/go/connect).

HP Surestore DAT 24 and DAT 24x6 devices are fast narrow SCSI devices and should be connected to a single-ended (SE) host bus adapter.

HP Surestore DAT 40 and DAT 40x6 devices are ultra wide SCSI devices. For optimum performance the device should be connected to a low voltage differential (LVD) SCSI host adapter. HP Surestore DAT 40 and DAT 40x6 devices may also be connected to SE (single-ended) SCSI host adapters, but cable length will be restricted to the SE rather than the LVD specification. If you would like more information on SCSI specifications and configuring your SCSI bus, read the "SCSI configuration" topic.

Your computer must have a properly installed and configured SCSI host adapter or a SCSI controller on the motherboard (SCSI-2 or SCSI-3 compliant) with driver software that supports the HP SureStore DAT drive. Connectivity information can be found on our World Wide Web site: //www.hp.com/go/connect. Check the server documentation for the specification of any built-in SCSI channels. Do not connect to a RAID controller channel; these are for disk drives only. Consult your supplier for further details.

For an internal drive or internal autoloader, you will need:

- A spare 5.25-inch, half-height bay in which to install the drive, or two adjacent half-height bays for an autoloader. You can install an internal drive into a 3.5-inch, half-height bay; use the special converter kit provided with your tape drive.
- A SCSI ribbon cable with active termination (a terminator block).
  The DAT 40i drive and DAT 40x6i autoloaders have a 68-pin wide SCSI connector. If your computer uses narrow SCSI, you will need a cable or adapter that enables you to connect a wide SCSI device (68 pins) into the narrow SCSI bus (50 pins). This can be purchased from your supplier.
  HP Surestore DAT 24i drives and DAT 24x6i autoloaders have a 50-pin narrow SCSI connector. If your computer uses wide SCSI, you will need a cable or adapter that enables you to connect a narrow SCSI device (50 pins) into the wide SCSI bus (68 pins). This is provided with your tape drive.
- Any special mounting tray or rails required to fix the drive into the empty bay.
  Check your 'Getting Started Guide' for details of which mounting hardware is supplied with your tape drive or autoloader.

For external drives and autoloaders, the cable provided with DAT 24, DAT 24x6e, DAT 40e and DAT 40x6e products will attach to a computer with a wide SCSI connector (68 pins). If the cable supplied with your drive is not appropriate for your computer's external SCSI connector, you will need to order a new cable. (See ordering supplies.)

For removable drives, no SCSI cables are required to plug the drive into an HP Surestore Tape Array 5300. However, cabling and terminators are required to connect the tape array with the SCSI host. Refer to your HP Surestore Tape Array 5300 Getting Started Guide for further details.

backup software

You need backup software that supports the HP Surestore DAT drive. We recommend using a backup application, which provides good memory management and also supports other useful features, such as TapeAlert. HP, Computer Associates, Veritas, Legato and Yosemite all provide suitable products that have been tested with HP Surestore DAT drives. A TapeWare CD-ROM containing backup software by Yosemite Technologies is supplied with your tape drive. For the latest list of backup packages that support HP Surestore DAT drives, please consult our World Wide Web site (www.hp.com/go/connect).

Details of how to best optimize your tape drive to achieve the maximum performance with your chosen backup application can be obtained from our World Wide Web Site (www.hp.com/support/dat).

Suitable backup applications will include driver software that establishes the interface between the tape drive and the software. Applications usually recognize tape drives by their manufacturers' ID string rather than their model number, so check the table below for the appropriate reference.

Drive Model	**ID String**
HP Surestore DAT 24	HP C1537A
HP Surestore DAT 24x6	HP C1557A
HP Surestore DAT 40	HP C5683A
HP Surestore DAT 40x6	HP C5713A

Windows NT and Novell NetWare backup utilities

If you have Windows NT installed, it contains a built-in backup utility. Similarly, you can use the SBACKUP utility provided with Novell NetWare. However, as neither of these utilities supports HP One-Button Disaster Recovery and other advanced capabilities for backup and restore, you may prefer to use the free backup software provided on the Yosemite TapeWare CD-ROM. This software provides full support for HP One-Button Disaster Recovery.

Before you can use the tape drive with these utilities, you must install the appropriate driver. Install the tape drive hardware before installing the driver. Drivers for Windows NT 3.51 and 4.0 and Novell NetWare 3.12, 4.10, and 4.11 are supplied on this HP Surestore Tape CD-ROM. Select the "Software" option on the Welcome page to install the drivers for Windows Backup or NetWare SBACKUP or you can follow the instructions for installing drivers provided in your operating system documentation.

For detailed information about drivers, refer to the appropriate README file in the DRIVERS directory on this CD. There is a separate sub-directory for each operating system.

You can also find frequently asked questions in the installing drivers topic.

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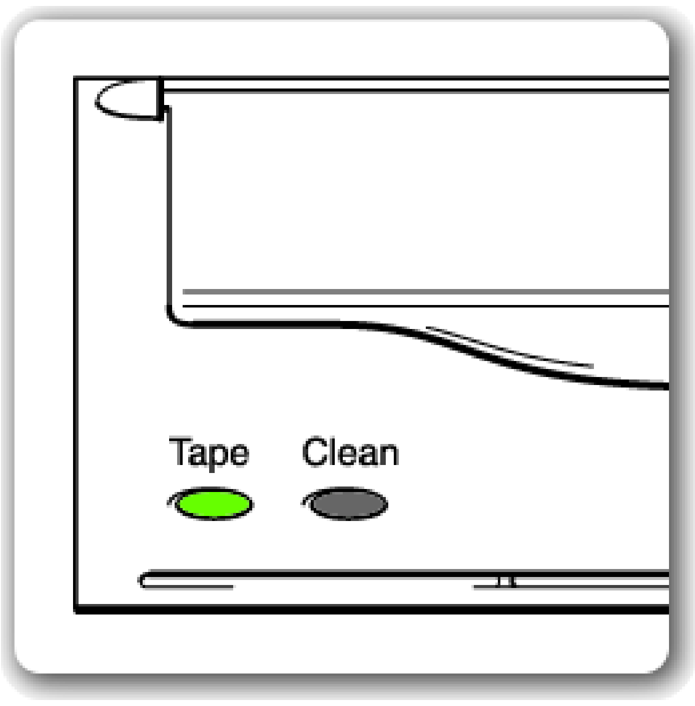
the front panel lights

contents of this section

- front panel lights
  - tape ready signal
  - tape loading signal
  - tape activity signal
  - media caution signal
  - error condition signal
  - OBDR mode signal

front panel lights

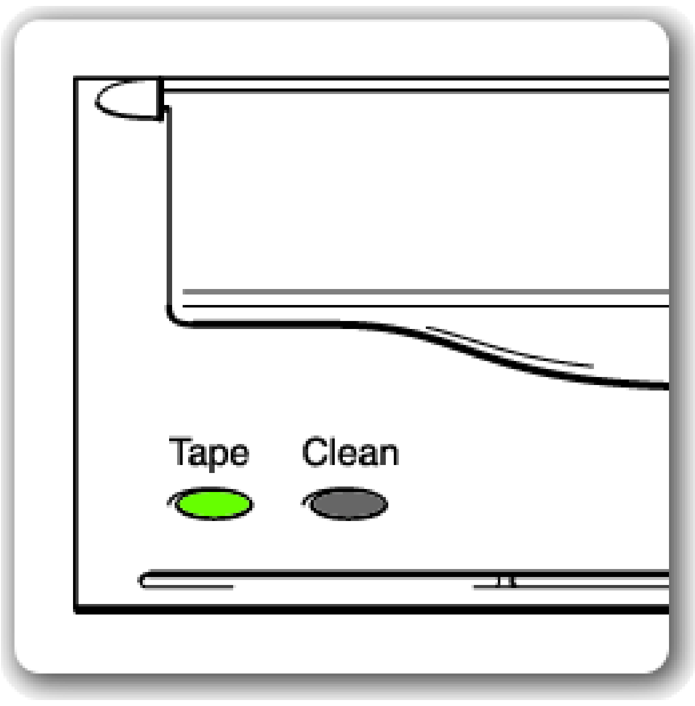
The front panel of your HP Surestore DAT drive has two lights (LEDs), Tape and Clean, that indicate the status of the tape drive as described below.



Tape ready signal

Tape	On, steady
Clean	Off

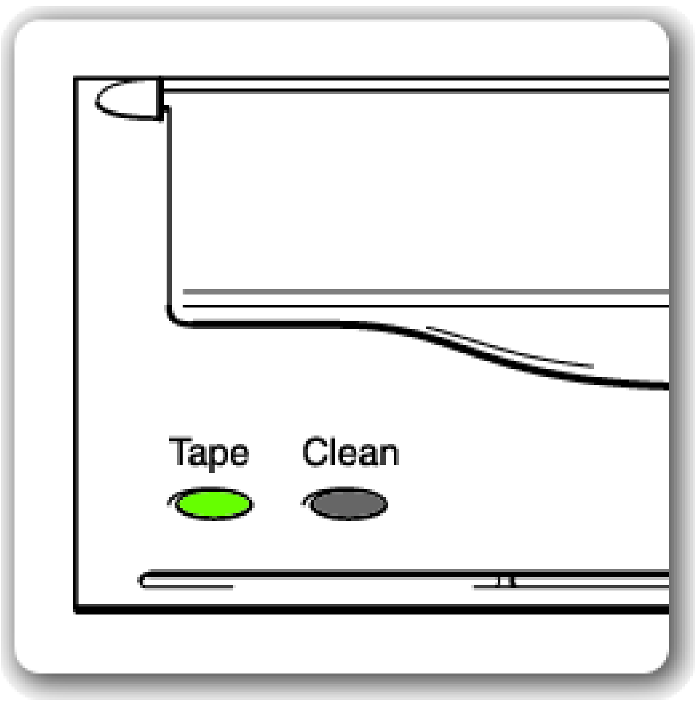
The cartridge is loaded and the drive is ready.



Tape loading signal

Tape	On, flashing slowly
Clean	Off

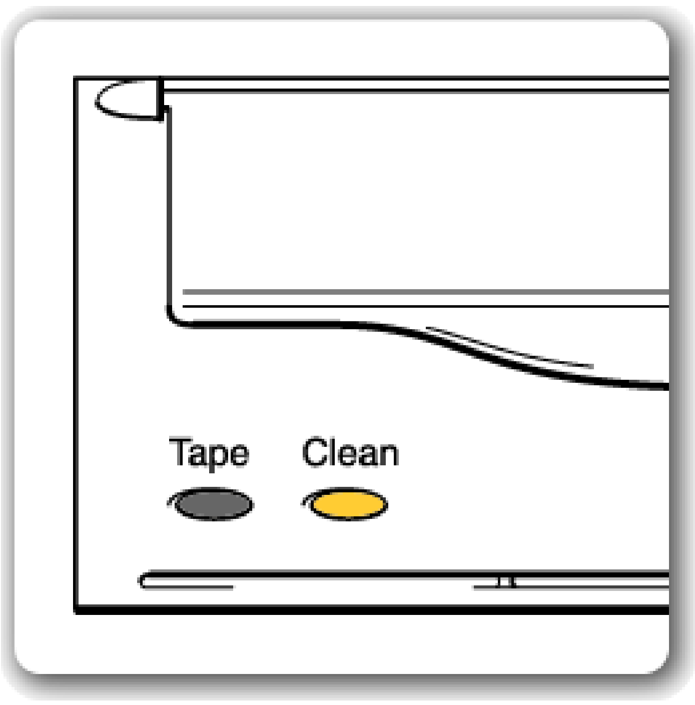
The cartridge is loading or unloading, or self-test is in progress.



Tape activity signal

Tape	On, flashing rapidly
Clean	Off

The cartridge is loaded, activity is occurring.

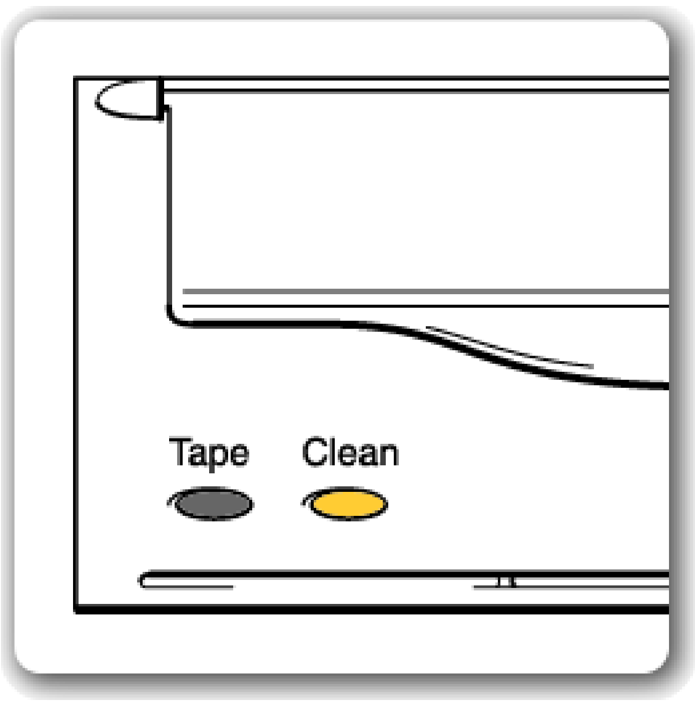


Media caution signal

Tape	Off, or flashing rapidly
Clean	On, flashing slowly

If the media caution signal is displayed:

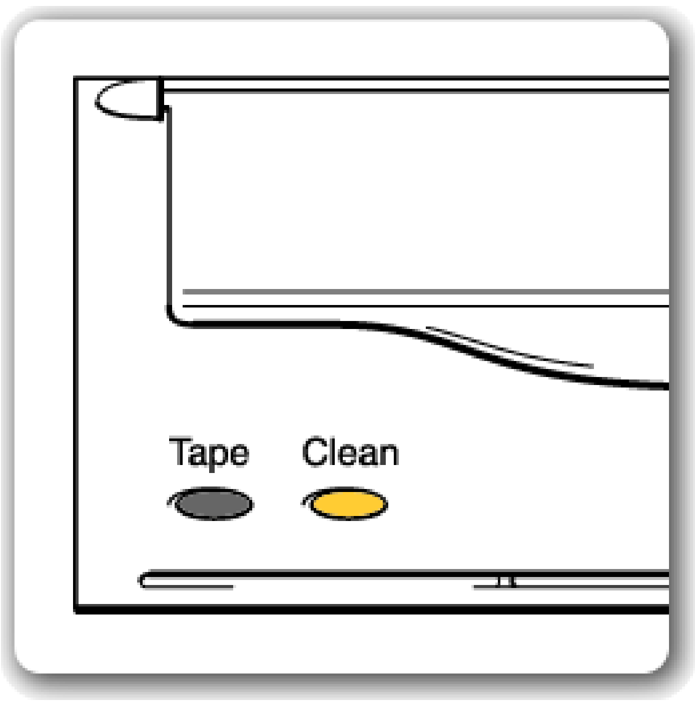
- Wait for the current operation to finish, then insert a different tape and repeat the operation that was being performed.
- If the media caution signal does not show this time, it indicates that the original cartridge was nearing the end of its useful life. Copy any data you want to keep from the original tape onto a new tape if possible, then discard the old tape.
- If the media caution signal appears again with the second tape, the tape heads need cleaning.
- If the media caution signal appears after using a cleaning cartridge, the cleaning cartridge has probably expired and should be discarded.



Error condition signal

Tape	Off
Clean	On, steady

HP Surestore DAT drives perform a comprehensive self-test during power-up. If a hard error causes the self-test to fail, the clean light changes to steady amber. Run HP Library & Tape Tools to help diagnose the problem.



OBDR mode signal

Tape	On, flashing slowly
Clean	On, flashing slowly, alternating with Tape LED

The tape drive is in disaster recovery mode, restoring the operating system.

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loading and unloading tape drives

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  - external drives
  - removable drives
- to unload a cartridge
  - internal drives
  - external drives
  - removable drives
- emergency unload

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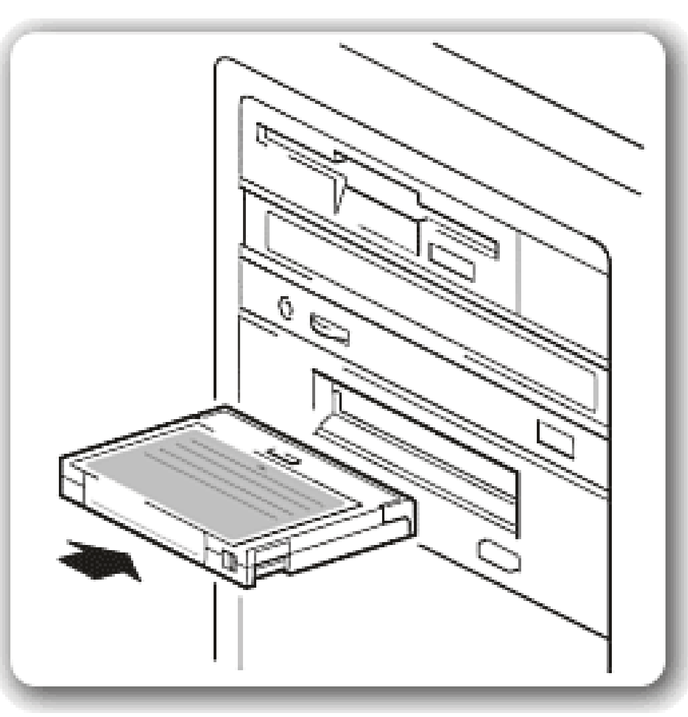
- labeling and write-protecting cartridges
- replacing a removable drive

to load a cartridge

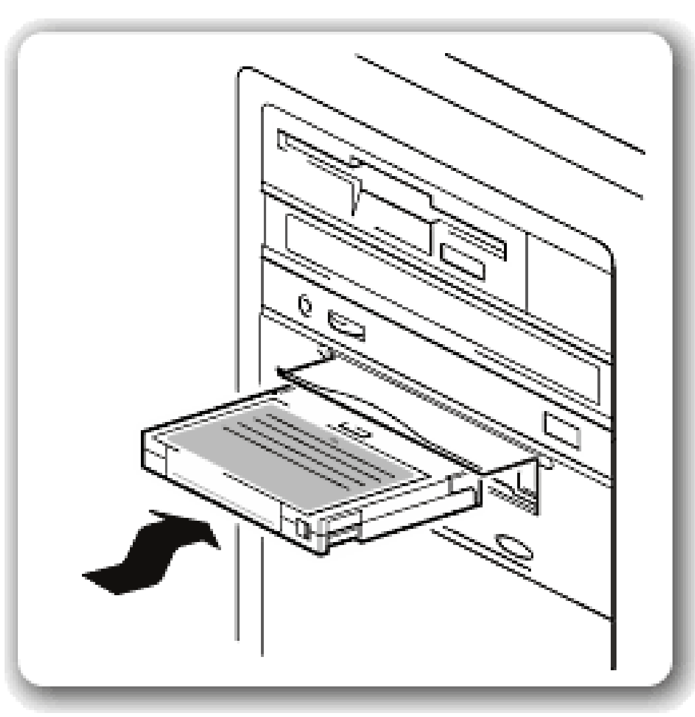
internal drives

Use the correct format HP DDS cartridge with your drive.

HP Surestore DAT drives are configured to detect DDS cartridges. Any cartridge that is not DDS will be treated as write-protected. This means you will only be able to read a non-DDS cartridge, not write to it.



hp surestore DAT 24i



hp surestore DAT 40i

1. **HP Surestore DAT 24i drives**
   These drives do not have a cartridge door. Just Insert the cartridge into the slot in front of the drive with the label uppermost.
   HP Surestore DAT 40i drives
   Slide the cartridge up under the lip of the cartridge door and insert it into the slot with the label uppermost.
2. Apply gentle pressure on the rear of the cartridge until the drive takes the cartridge and loads it.

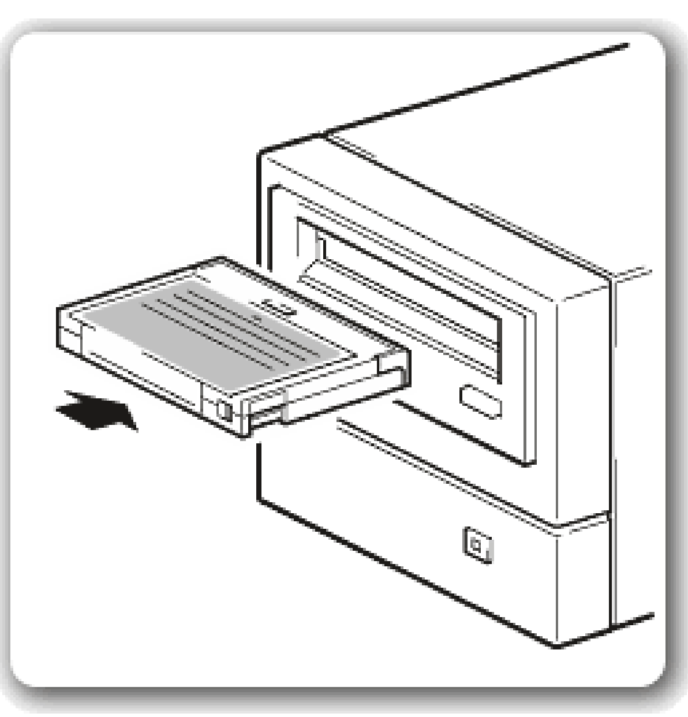
Do not try to force the cartridge if it does not load properly. The drive will eject the cartridge after about 10 seconds so you can load it again.

When you insert a cartridge, the drive performs a short load sequence. This takes about 5 seconds, during which the Tape light flashes green. When the load sequence is finished, the Tape light shows steady green.

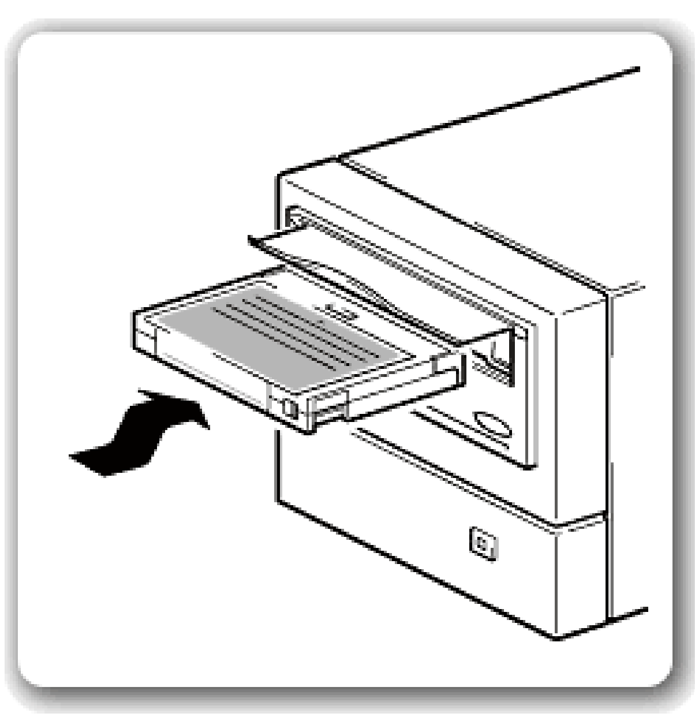
external drives

Use the correct format HP DDS cartridge with your drive.

HP Surestore DAT drives are configured to detect DDS cartridges. Any cartridge that is not DDS will be treated as write-protected. This means you will only be able to read a non-DDS cartridge, not write to it.



hp surestore DAT 24e



hp surestore DAT 40e

1. **HP Surestore DAT 24e drives**
   These drives do not have a cartridge door. Just Insert the cartridge into the slot in front of the drive with the label uppermost.
   HP Surestore DAT 40e drives
   Slide the cartridge up under the lip of the cartridge door and insert it into the slot with the label uppermost.
2. Apply gentle pressure on the rear of the cartridge until the drive takes the cartridge and loads it.

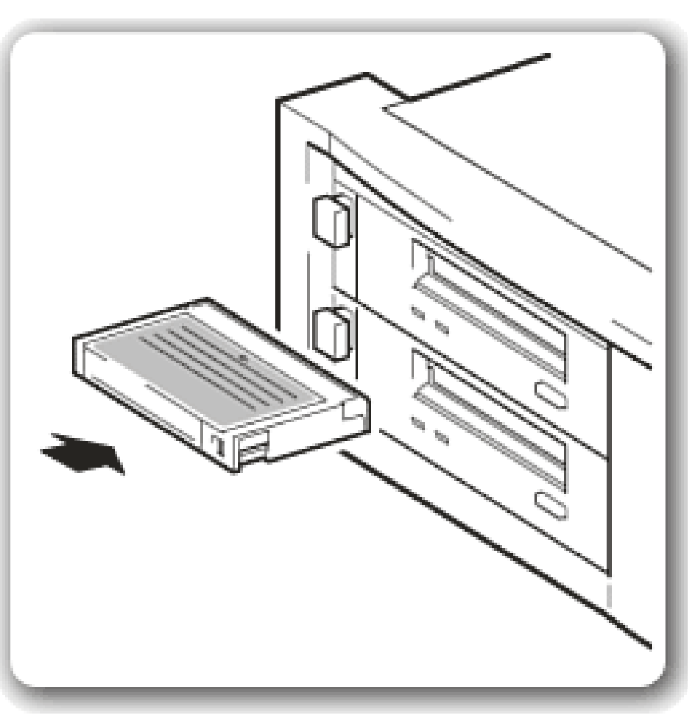
Do not try to force the cartridge if it does not load properly. The drive will eject the cartridge after about 10 seconds so you can load it again.

When you insert a cartridge, the drive performs a short load sequence. This takes about 5 seconds, during which the Tape light flashes green. When the load sequence is finished, the Tape light shows steady green.

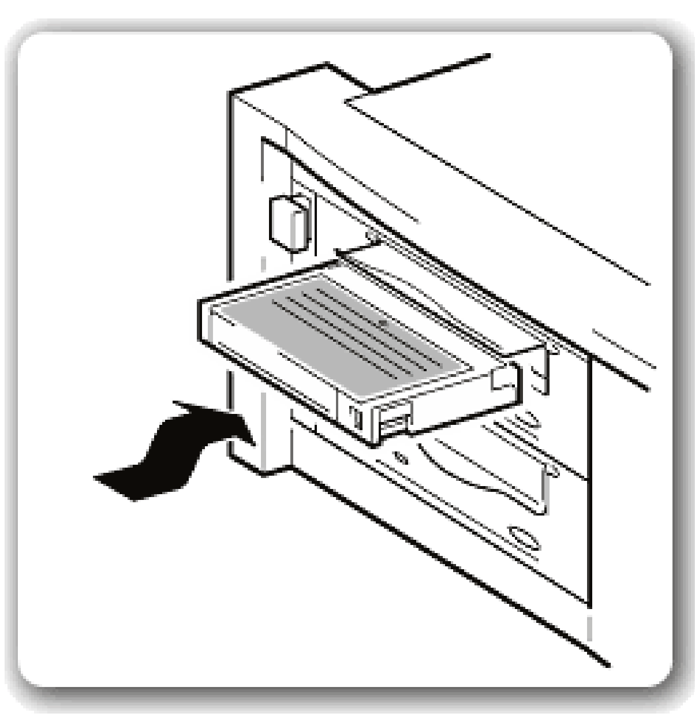
removable drives

Use the correct format HP DDS cartridge with your drive.

HP Surestore DAT drives are configured to detect DDS cartridges. Any cartridge that is not DDS will be treated as write-protected. This means you will only be able to read a non-DDS cartridge, not write to it.



hp surestore DAT 24m



hp surestore DAT 40m

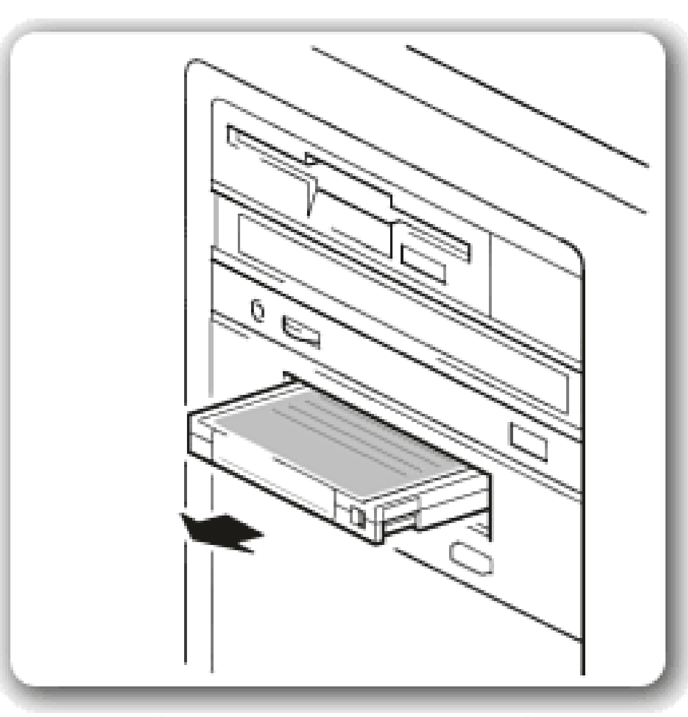
1. **HP Surestore DAT 24i drives**
   These drives do not have a cartridge door. Just Insert the cartridge into the slot in front of the drive with the label uppermost.
   HP Surestore DAT 40i drives
   Slide the cartridge up under the lip of the cartridge door and insert it into the slot with the label uppermost.
2. Apply gentle pressure on the rear of the cartridge until the drive takes the cartridge and loads it.

Do not try to force the cartridge if it does not load properly. The drive will eject the cartridge after about 10 seconds so you can load it again.

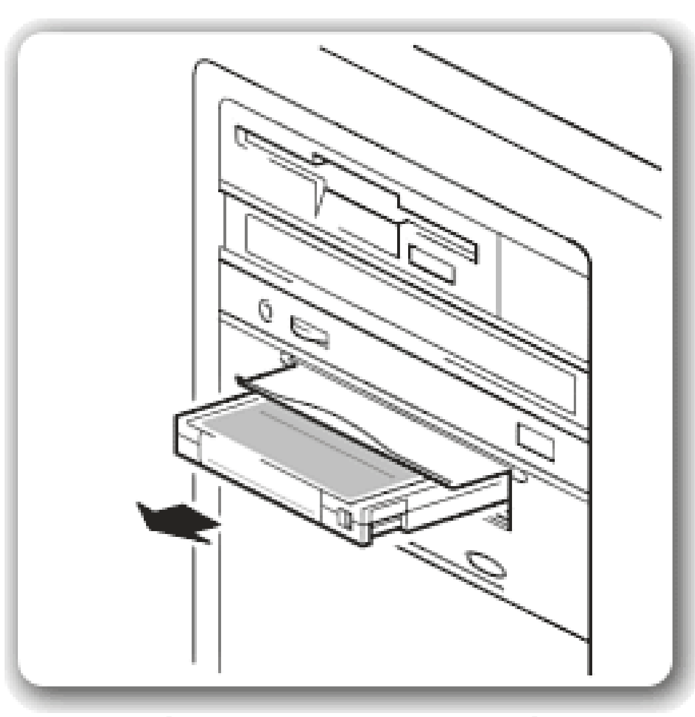
When you insert a cartridge, the drive performs a short load sequence. This takes about 5 seconds, during which the Tape light flashes green. When the load sequence is finished, the Tape light shows steady green.

to unload a cartridge

internal drives



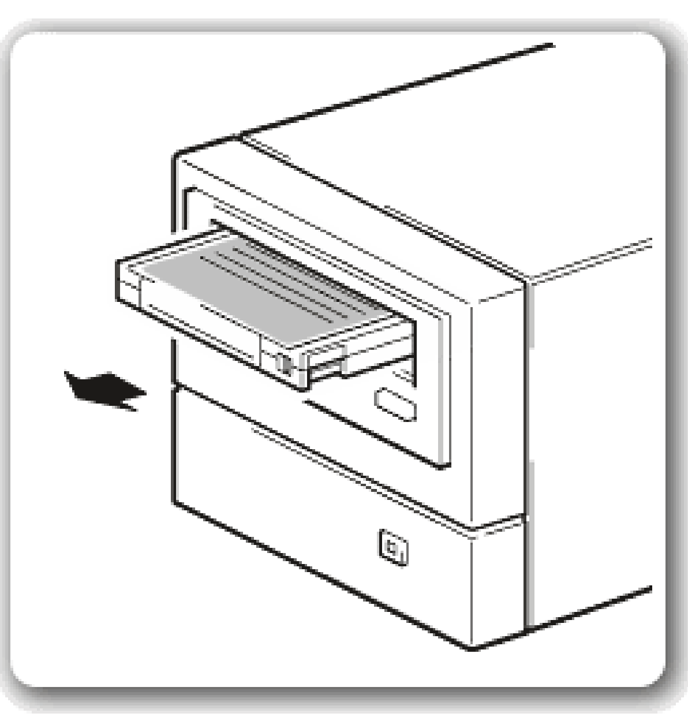
hp surestore DAT 24i



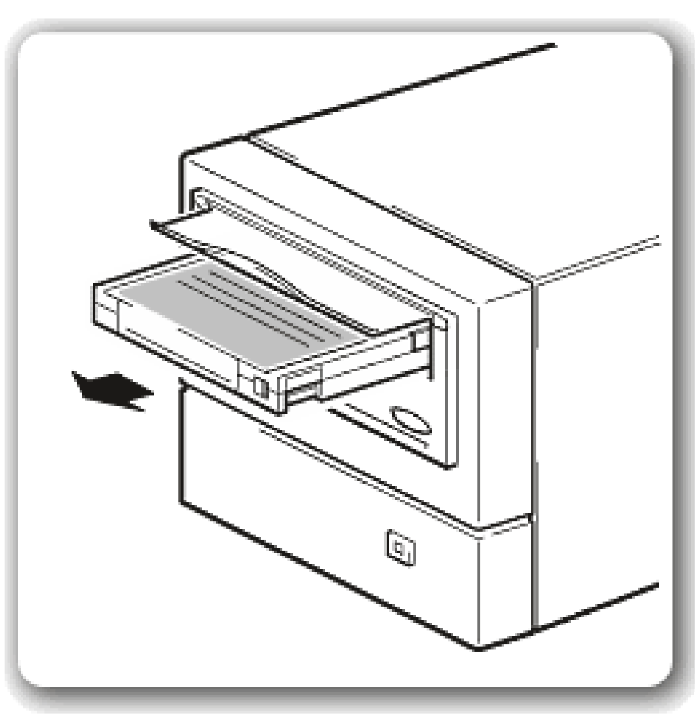
hp surestore DAT 40i

1. Press the Eject button on the front panel.
   During the unload sequence the Tape light flashes green. The drive completes any task it is currently performing, winds the tape to the beginning and ejects the cartridge. The sequence can take up to 25 seconds for a write-enabled cartridge and 10 seconds for a write-protected cartridge. The sequence may take longer if the tape needs to be rewound first.
2. Remove the cartridge and store it in its plastic case.

external drives



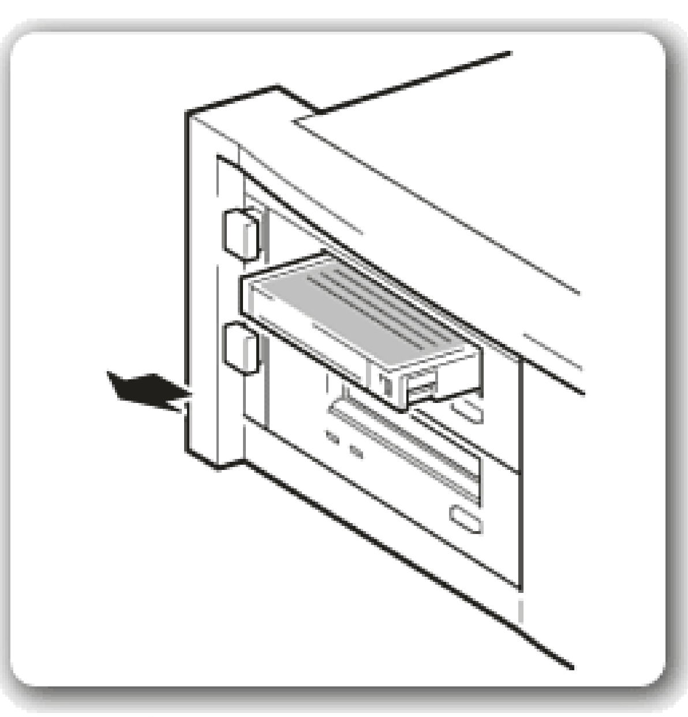
hp surestore DAT 24e



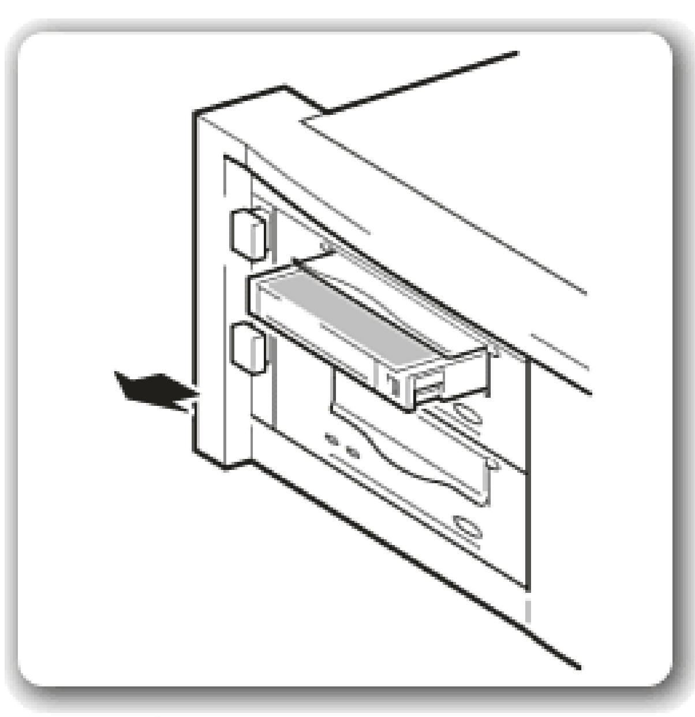
hp surestore DAT 40e

1. Press the Eject button on the front panel.
   During the unload sequence the Tape light flashes green. The drive completes any task it is currently performing, winds the tape to the beginning and ejects the cartridge. The sequence can take up to 25 seconds for a write-enabled cartridge and 10 seconds for a write-protected cartridge. The sequence may take longer if the tape needs to be rewound first.
2. Remove the cartridge and store it in its plastic case.

removable drives



hp surestore DAT 24m



hp surestore DAT 40m

1. Press the Eject button on the front panel.
   During the unload sequence the Tape light flashes green. The drive completes any task it is currently performing, winds the tape to the beginning and ejects the cartridge. The sequence can take up to 25 seconds for a write-enabled cartridge and 10 seconds for a write-protected cartridge. The sequence may take longer if the tape needs to be rewound first.
2. Remove the cartridge and store it in its plastic case.

emergency unload

If you press the Eject button when the drive is busy, the drive may take some time to respond because it will finish the task it is performing first. This ensures that no data is lost. On rare occasions, however, a system or software fault may cause the tape drive not to respond to an Unload request. In this situation, you can force ejection.

There are two ways of doing this:

- Press the Eject button three times within 5 minutes.
- Hold the Eject button down for at least 15 seconds.

Following either of these actions, the drive waits until 35 seconds have passed from the time of the first press, to give the normal eject procedure a chance to proceed. After this period, it immediately releases the tape and ejects the cartridge, regardless of what operation it was performing. The drive is then reset as though you had turned the power off and then on again.

Caution: You may lose data if you force ejection of a cartridge. The tape may also become unreadable because an EOD (End of Data) mark may not be properly written.

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replacing a removable drive

contents of this section

- overview
- removing a drive
- replacing a drive

overview

HP Surestore DAT removable drives can be removed and replaced without powering down the tape array, providing they are not on the same SCSI bus.

If all drives in the tape array are powered up when the system is turned on, the host will be aware of those drives. You can remove any of those drives and replace it with another drive.

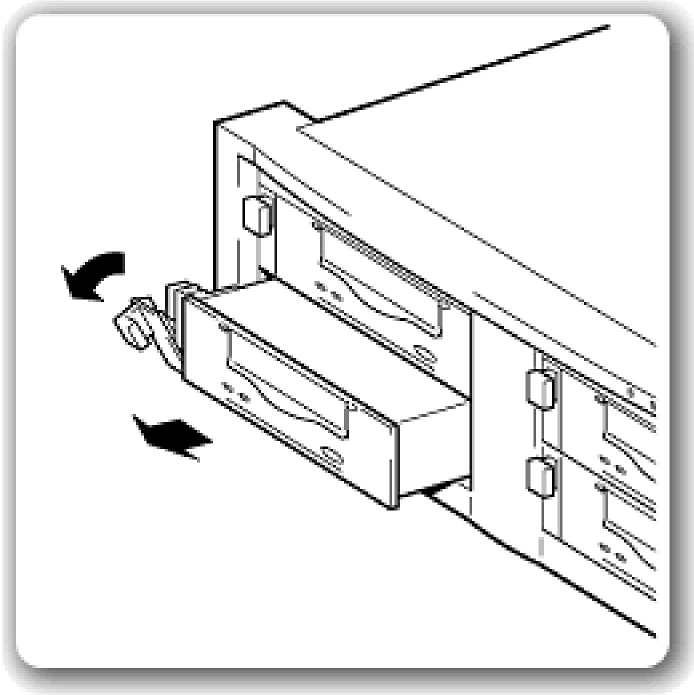
If a drive is not powered up or you place a drive in an empty slot after the system has been powered up, the system will have to be reset before the host will recognize the drive.

Removable drives allow modules to be replaced while powered up as long as no data is being transmitted from the system to the module or to any other module daisy-chained on the same SCSI bus (off-line hot-swap). The SCSI IDs are controlled by the tape array, not by the drives themselves, so if you remove a drive and replace it with another the ID will not change.

If your system is running HPUX, you should be aware of the following when removing a drive:

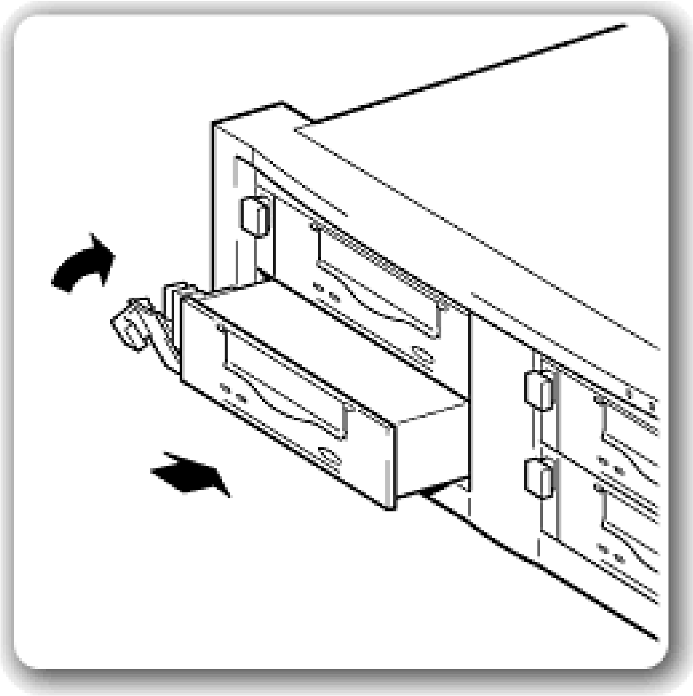
- In Berkeley mode, the tape position will remain unchanged by a device close operation
- In AT&T mode, a device close operation will cause the tape to be repositioned just after the next tape filemark (the start of the next file).

removing a drive



1. Pull the extraction lever of the drive that you want to replace so that it is in the out position.
2. Using the extraction lever, pull the drive carefully and firmly out of the tape array.

replacing a drive



1. Ensure that the extractor lever on the drive is in the out position, as shown in the picture.
2. Lift the drive carefully.
3. Align the rear of the drive with the guides on the side of the HP Surestore Tape Array 5300.
4. Slide the drive along the guides until the connectors on the back mate with the connectors at the back of the enclosure.
5. Push the extractor lever in until it locks the drive in position.

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choosing a backup strategy

contents of this section

- choice of strategy
- the ten-tape cycle method
- cleaning as part of your routine
- extending your backup strategy

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choice of strategy

How you organize backup depends very much on how frequently the data changes, how extensive these changes are, and how valuable you consider the information. What is essential is that you follow a routine, so that backup is regular and trouble-free.

There are many systematic methods for backing up data on a regular basis. The ten-tape cycle method recommended in this section is very simple to implement. It also maintains several historical copies of the data so that even if one copy is lost you have a high probability of recovering your lost data.

To ensure longevity of your tapes, it is important to follow the tape usage and storage recommendations outlined in Caring for Cartridges. If you follow the backup method described in this section, you should renew your tapes each year. (Since no one tape should be used more than 100 times, annual renewal allows for a number of restores in addition to backups.)

the ten-tape cycle method

The ten-tape cycle method uses a systematic approach to ensure data security. It involves maintaining a daily, weekly and monthly backup. Every three months the monthly tapes are recycled.

The advantages of this method are:

- **Simplicity:** It is very easy to recover data.
- **Ease of Access:** Data backed up any time over the preceding two months can be easily found and restored.

number of tapes needed

If all the data you wish to back up in a single session will fit onto a single tape, ten tapes are needed, plus any additional tapes you may require for archival storage or file transfers.

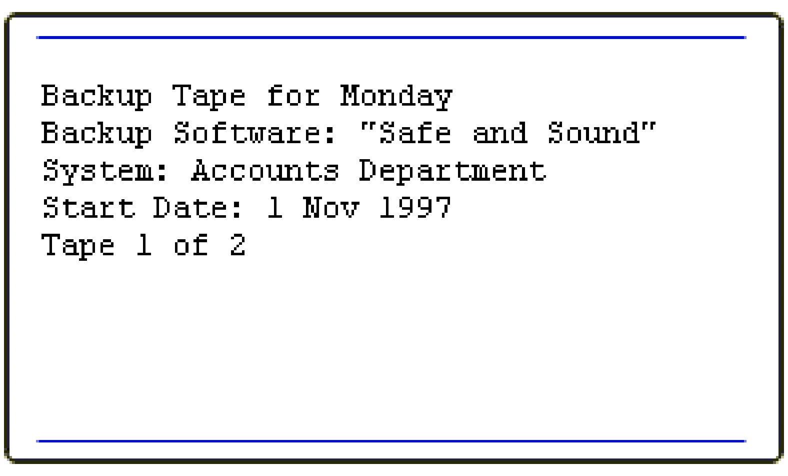
If you require more than one tape per backup, you will need ten sets of tapes, where a "set" is the smallest number of tapes that will hold a full backup.

Before making a backup, label the ten tapes as follows:

Monday	Friday 1	Month 1
Tuesday	Friday 2	Month 2
Wednesday	Friday 3	Month 3
Thursday		

In addition, record on the label the date when you first started using the tape, the name of the system you are backing up, and the backup software used. If you need more than one tape to perform a full daily backup, also record the tape number (such as "Tape 1 of 2").

A sample label is shown below.



Backup Tape for Monday
Backup Software: "Safe and Sound"
System: Accounts Department
Start Date: 1 Nov 1997
Tape 1 of 2

method

1. At the end of each Monday, Tuesday, Wednesday and Thursday, perform a full backup to the tape labeled for that day.
2. At the end of the first, second and third Fridays of the month, perform a full backup to the tape labeled for that day.
3. At the end of fourth Friday of the month, back up to the tape labeled for that month.
4. At the end of the fourth month, recycle the monthly tapes; that is, back up to the tape labeled "Month 1."

For additional security, place each of the Friday and monthly tapes in a fire-proof safe or store them off-site.

cleaning as part of your routine

Cleaning the drive's tape heads regularly should be an important part of your data security program. Build a cleaning cycle into your backup regime, so that it is not ignored. Use the recommendations in Cleaning the Tape Heads as a guide for how often to schedule head cleaning.

extending your backup strategy

You can extend the ten-tape backup routine in several ways:

- Use more monthly tapes. Twelve monthly tapes would give a backup horizon of a whole year.
- Build in another more infrequent cycle. For example, you could have a set of quarterly tapes used for a full backup on the last working day of each quarter. These could then be archived indefinitely.

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autoloader operation

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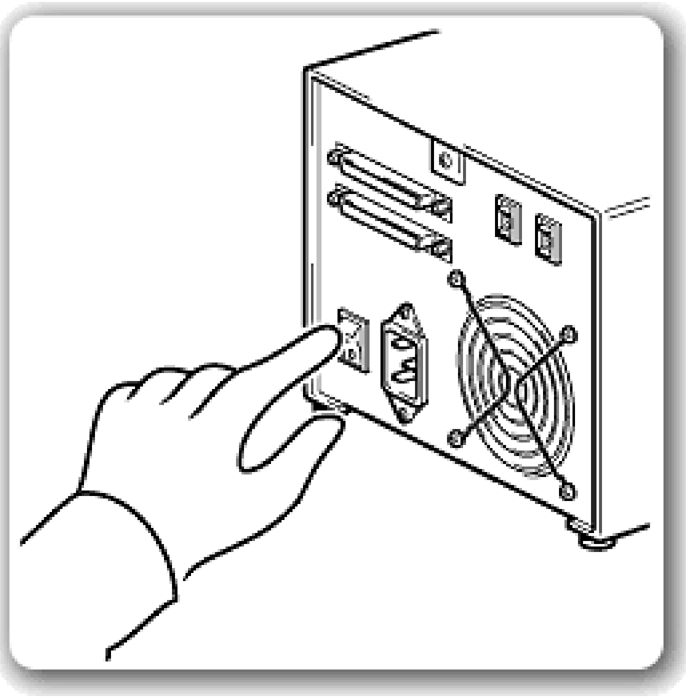
- switching on the autoloader
- if you have problems during self-test
- power-cycling

related topics

- interpreting the front panel lights
- loading and unloading autoloaders
- cartridges
- localizing language display (DAT 40x6 only)
- autoloader modes of operation

switching on the autoloader

External autoloaders: Switch on the autoloader using the power switch on the rear panel by pressing the side with the I symbol down, and then switch on the computer.

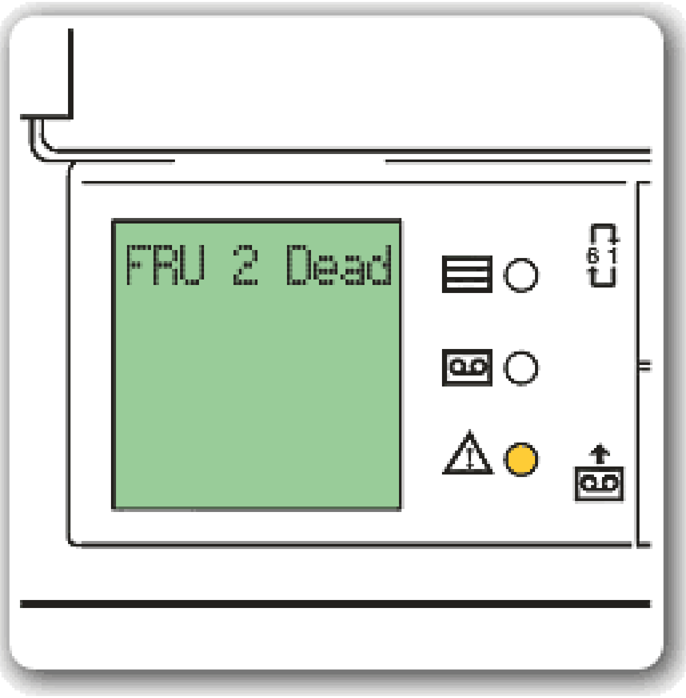


Internal autoloaders are powered on when you switch on your computer.

Wait for the autoloader to complete its self-test routine, during which the front panel lights flash and the display shows the message `Self Test`. The HP SureStore DAT 40x6 autoloader alternates this display with its serial number.

After a successful self-test, the lights stop go out and the autoloader displays the message `Insert Mag` if there is no magazine loaded. If there is a magazine loaded, the message will say `Mag Loaded` and the green Magazine Present light (top) will be lit steadily.

if you have problems during self-test



If the Operator Attention Required light (bottom) shows steady amber at the end of the self-test, this indicates a fault condition:

- If you have just installed the drive, check the installation for loose connections and repeat the self-test.
- Try the troubleshooting procedures or run HP Library & Tape Tools to determine what the problem is.
- If the fault condition persists, write down the message displayed on the front panel and call for service.

power-cycling

To ensure reliable operation, do not switch off power to the autoloader while it is reading, writing, fast-searching, loading or unloading.

If the cartridge has just been unloaded from the drive (but has not been returned to the magazine) when the autoloader is switched off, the cartridge will be taken into the drive and threaded when the drive is next powered up.

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front panel lights

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  - select button
  - load cartridge button
  - eject button

related topics

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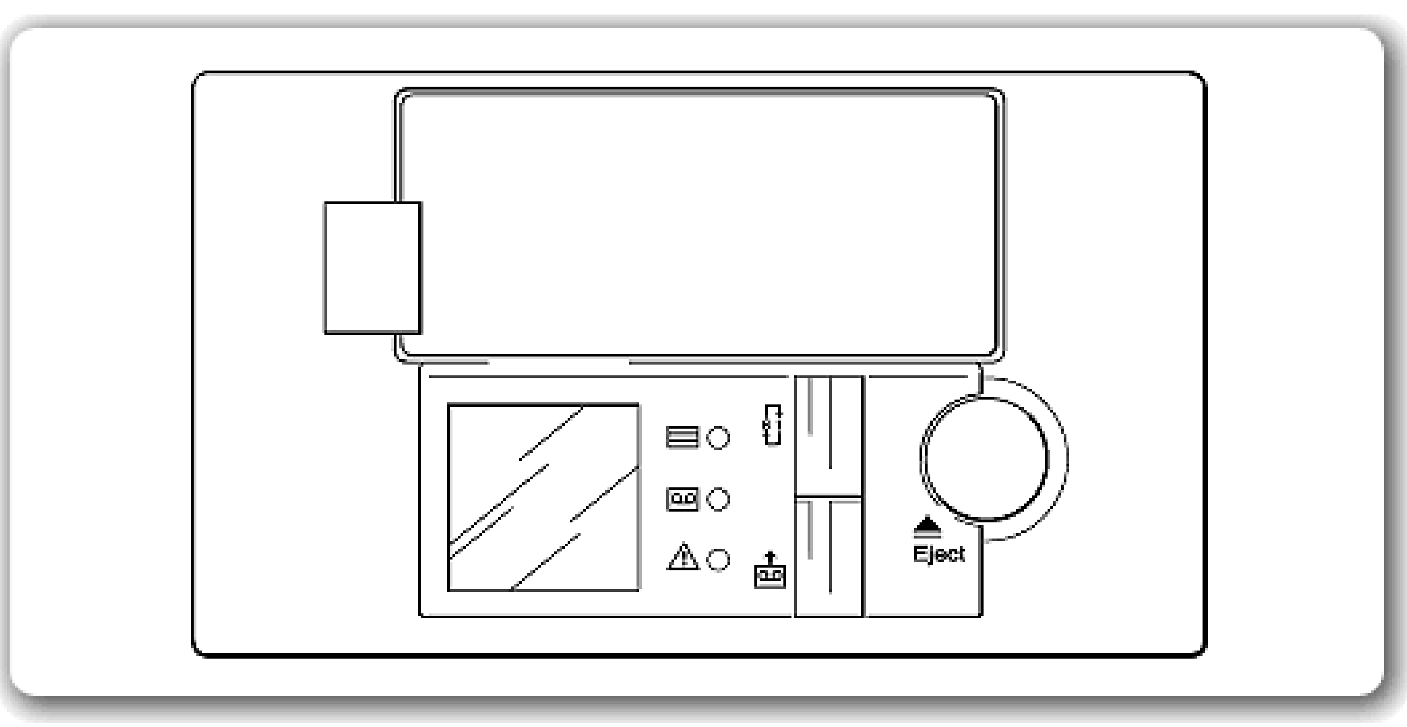
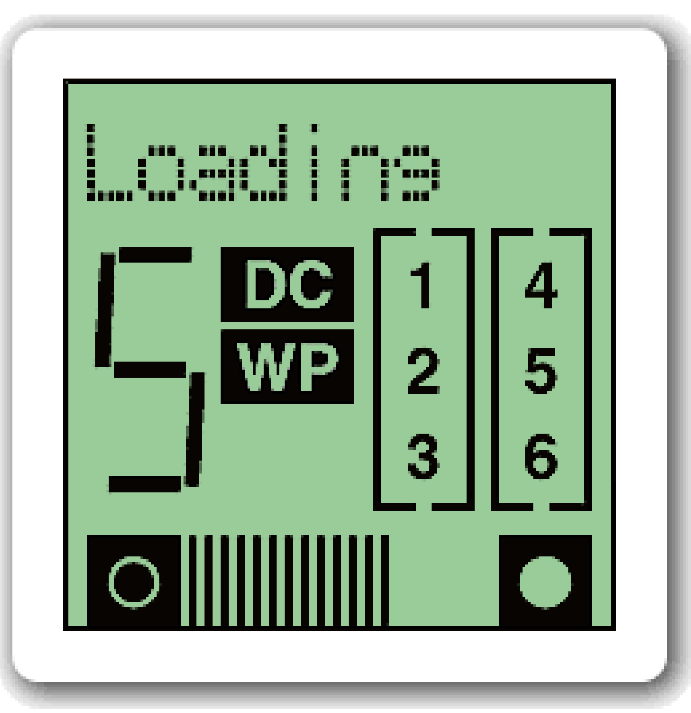
- modes of operation

front panel controls and indicators



The front panel of your HP Surestore DAT autoloader has a LCD display panel, three lights (LEDs), and three buttons as described below.

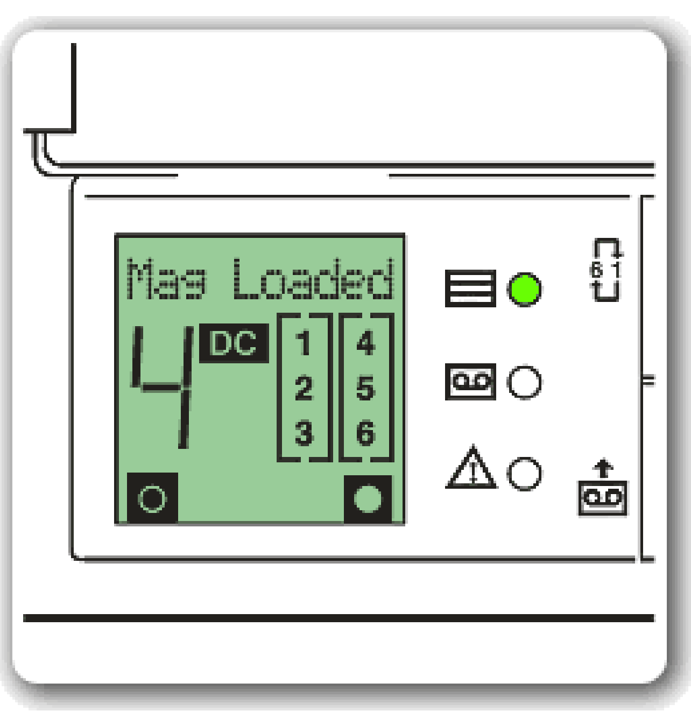
LCD display



The LCD display shows status information about the autoloader in each of its five regions. Note that this exact display can never occur; all sections are showing at the same time so that you can see where they are.

1. The ten-character dot matrix display provides information on the autoloader's operating status and potential error conditions. See Front Panel Messages for details of messages that can be displayed here.
2. The large numeral shows the number of the cartridge currently loaded in the drive or the cartridge that you have selected by pressing the Select button repeatedly.
3. "DC" is displayed when data compression is being used for writing. "WP" is displayed when the cartridge is write-protected.
4. The six numbered boxes on the right of the display are individually lit to show which magazine slots contain cartridges.
5. The display at the bottom of the display shows how much tape has been used in the current partition. The more lines shown, the more tape has been used. When all the lines show, the partition is full.

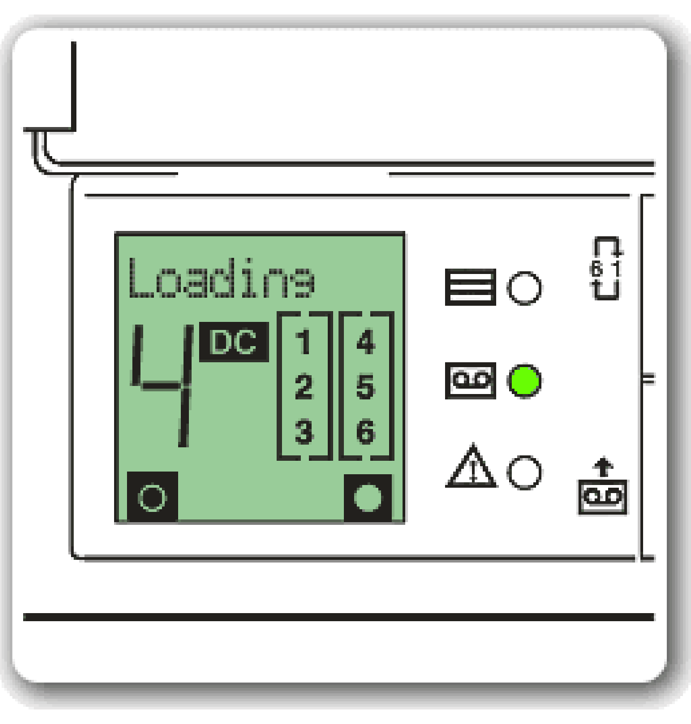
magazine present light (top)



This green light indicates the state of the magazine:

- **On** indicates that a magazine is loaded.
- **Flashing** indicates that a magazine is in the process of being loaded, checked, or ejected.
- **Off** indicates that no magazine is in the autoloader.

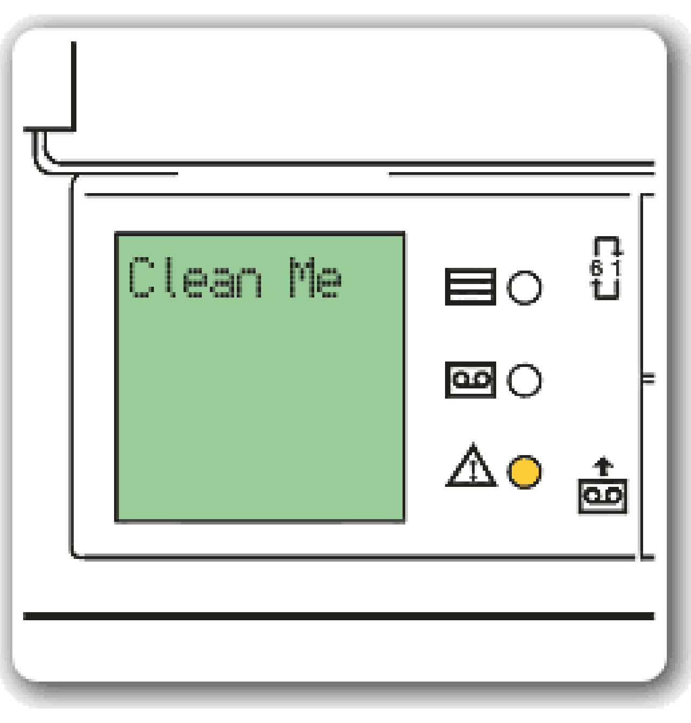
tape activity light (middle)



This green light indicates the activity of the autoloader's internal tape drive:

- **On** indicates that a cartridge is present in the drive.
- **Fast flashing** indicates that the data is being read or written.
- **Slow flashing** indicates that a cartridge is being loaded or unloaded.
- **Off** indicates that there is no cartridge in the drive.

OAR light (bottom)



The Operator Attention Required amber light indicates warning conditions:

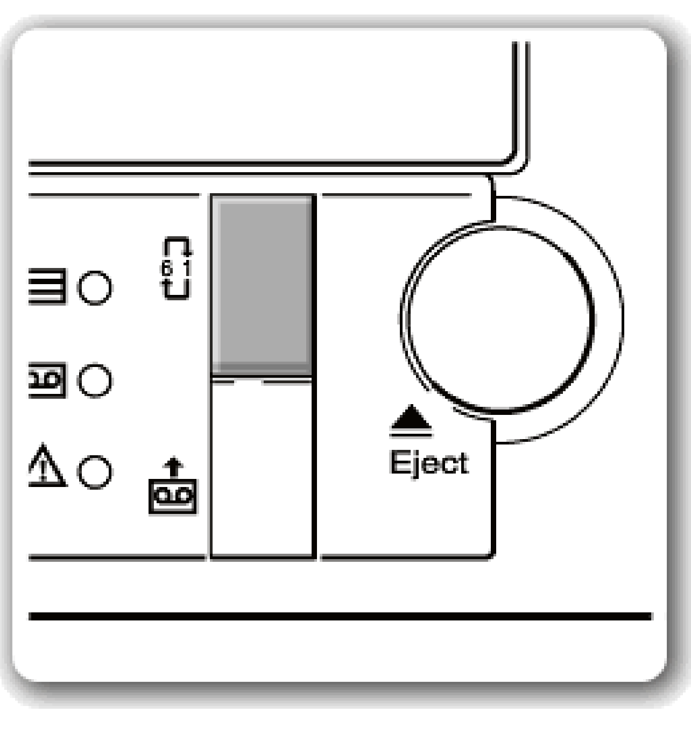
- **On** indicates that a serious hardware error has occurred.
- **Fast flashing** (four times per second) indicates that a firmware upgrade is taking place.
- **Medium flashing** (twice per second) indicates that the tape cartridge or tape head needs attention.
- **Slow flashing** indicates some other error condition, see below.

what to do if operator attention is required

The following guidelines suggest what to do, if the OAR warning light sequence requires operator attention:

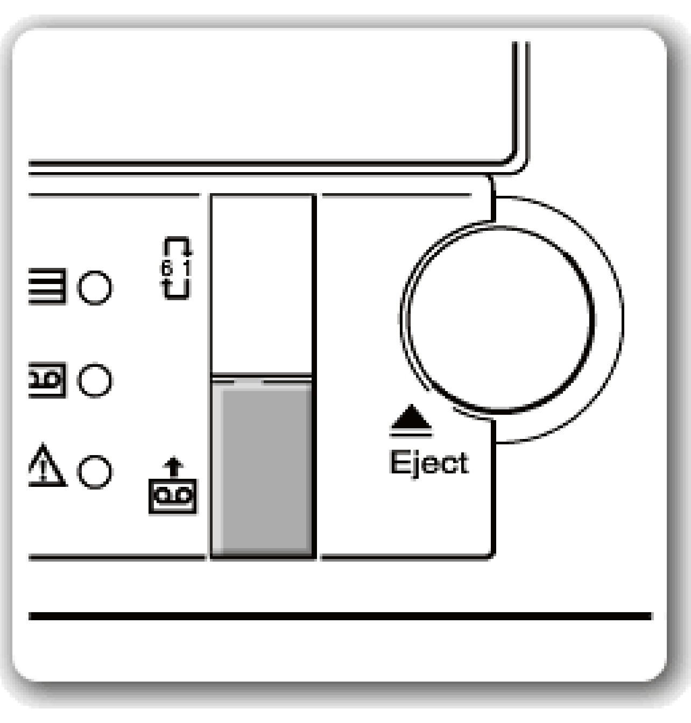
- **On** indicates that a serious hardware error has occurred.
  - If you have just installed the drive, check the installation for loose connections and repeat the self-test.
  - Try the troubleshooting procedures or run HP Library & Tape Tools to determine what the problem is.
  - If the fault condition persists, write down the message displayed on the front panel and call for service.
- **Medium flashing** (twice per second) indicates one of the following conditions:
  - The tape cartridge is wearing out and should be replaced. The "`Worn Media`" message will be displayed in this case. Copy any data you wish to keep onto a new cartridge and discard the old cartridge
    or
  - The tape heads need cleaning. The "`Clean Me`" message will be displayed in this case. The HP Surestore DAT 40x6 autoloader also displays the URL for our World Wide Web Support page. See Cleaning the Tape Heads for further information.
- **Slow flashing** indicates one of the following conditions:
  - The front panel door is open when it should not be. The "`Close Door`" message will be displayed in this case.
  - There is a cartridge in the tape drive, but no magazine is present. The "`Stray Tape`" message will be displayed in this case. Load an empty magazine to retrieve the cartridge.
  - A hard fault condition has occurred. The message displayed will give information about the type of error. Look up the message in Front Panel Messages to determine what to do.

select button



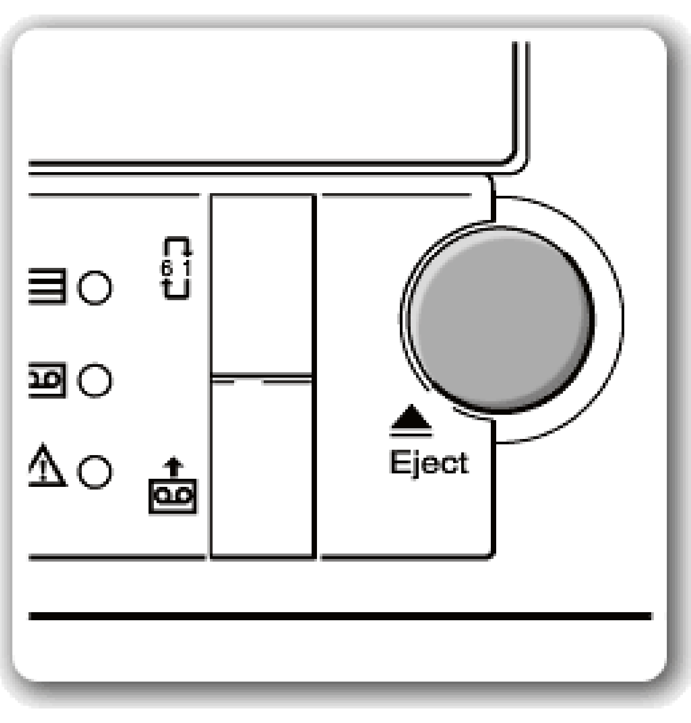
The Select button allows you to select any of the cartridges in the magazine for loading. If you press the button repeatedly, the number on the left of the front panel display cycles through the cartridges available in the magazine.

load cartridge button



Press the Load Cartridge button to load the selected cartridge from the magazine into the drive and then put the autoloader into stacker mode. In stacker mode, the loaded cartridge is used first; when it is full, or the host computer sends an `UNLOAD` command, the autoloader replaces it with the cartridge from the next highest numbered slot in the magazine. See Autoloader Modes of Operation for more information on stacker mode.

eject button



Press the Eject button to start the unload process. The drive unloads any cartridge that is currently loaded, and the changer mechanism returns the cartridge to the magazine. The magazine is then ejected.

You can also use the Eject button to force an ejection in an emergency. See Forcing Ejection for more information on when and why you might do this.

Note: The host computer can disable the Eject button by issuing a `SCSI PREVENT MEDIA REMOVAL` command.

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front panel messages

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- front panel controls and indicators
- autoloader operation
- modes of operation

front panel messages

The messages that can be displayed on the front panel can be divided into three categories:

- Normal autoloader operating status messages
- Error messages
- Information messages

These types are described below. All the messages are listed in alphabetical order below. The type of message is indicated by the letter **S** (Status), **E** (Error) or **I** (Informational) in the Type column.

Note: the HP Surestore DAT 40x6 autoloader also displays the URL of our World Wide Web Support page with certain messages.

status messages

The status messages that appear on the front panel inform you of activity in five areas:

- The self-test
- Magazine activity -- if the magazine is being checked or ejected
- Cartridge activity -- if a cartridge is being loaded or unloaded, or if the heads are being cleaned
- Tape activity -- reading, writing, searching, rewinding and so on
- Firmware upgrading

error messages

The front panel display can display a range of error messages relating to the autoloader's operation. If a fault has been detected with the mechanism, or loss of data may result, the error message may be accompanied by the Operator Attention Required light being on or flashing. This is indicated in the OAR column in the alphabetical list of messages below. Where possible, actions you can take to recover from the error are also given.

information messages

Information messages are displayed when power is applied to the autoloader. They indicate its identity, SCSI ID and configuration. They also tell you when you have pressed the front panel buttons to confirm that the autoloader has recognized the action.

hp surestore DAT 40x6 and language selection

HP Surestore DAT 40x6 models allow you to localize the LED display so that messages are displayed in the desired language.

1. Switch on the autoloader and hold down the Select button on the front panel for five seconds to access the `Language?` feature.
2. Press the Select button to scroll through the available languages. The selected language is displayed in the LCD display.
   If you select `Numeric`, messages will be displayed as numerical codes, which are defined below.
3. Press the Load button to store the selected language and exit the language selection utility.

To exit the language selection facility without selecting a language, press the Enter button. If the Select button is not pressed for two minutes, the drive will automatically exit the language selection facility without selecting a language.

hp surestore DAT 40x6 and number codes

The HP SureStore DAT 40x6 autoloader has a language selection feature, which allows you to localize the display for French, German, Spanish, Portuguese or Japanese. If your language is not supported, you can select a Numerical code instead and refer to the Messages section below for an explanation of the code. The messages are in alphabetical order, but you can jump directly to the required message by selecting the number from the following list:

0000

1001
1002
1003
1004
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1021
1022
1023
1024

2001
2002
2003
2006
2007
2008
2009
2010

3001
3002
3003
3004
3005

4000
4001
4002
4003

8000
8001
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8026
8027

message codes

The following abbreviations are used in the message listing below:

Type Column		**OAR Column**	
E	Error message	O	OAR light is on
I	Information message	F	OAR light is flashing
S	Status message		

The following list gives the messages that can be shown on the front panel display in alphabetical order. Some of these messages only appear on HP Surestore DAT 40x6 autoloaders.

Number	Message	Type	OAR	Meaning
1019	At BOD	E	O	A SPACE command encountered BOD (Beginning of Data) unexpectedly. The tape is now positioned at BOD.
1018	At EOD	E	O	A READ or SPACE command encountered the EOD (End of Data) area unexpectedly. The tape is now positioned at EOD.
8014	Bad Media	E	F	A READ or SPACE command has failed because the tape cartridge is not in DDS format. Action: Unload the cartridge and use a DDS-certified (Media Recognition System) cartridge. See Choosing Cartridges.
8021	Cannot Write Non-MRS Tape	E	F	A `WRITE`, `WRITE FILEMARK` or ERASE command has been attempted on a non-Media Recognition System cartridge. Action: Remove the cartridge and replace with a Media Recognition System cartridge. See Choosing Cartridges.
8009	Clean Fail: Check Cleaning Tape	E	F	Cleaning failed, possibly due to an expired cleaning tape. Action: Use a new cleaning cartridge.
2001	Clean Me	E	F	A high error rate has been detected reading or writing. Action: Insert a cleaning cartridge to clean the tape heads, ensuring that the tape in the cleaning cartridge has not been used up. See Cleaning the Tape Heads.
1008	Cleaning	S		A cleaning cartridge has been loaded into the drive mechanism.
	Config: xxy	I		This message is displayed for two seconds during the power-up sequence following the SCSI ID. "xx" is the hex value of the configuration switch setting on the underside of the autoloader. "y" is the autoloader option switch value set on the rear panel of the autoloader.
2006	Close Door	E	F	The front panel door is open. Any autoloader motion will be delayed. Action: This is probably caused by a magazine that is partly inserted through the door. Push the magazine fully into the drive or remove it.
8002	Drive Comms Error	E	O	The drive has stopped communicating with the changer mechanism. Action: Call for service.
8001	Drive Fault	E		The drive has detected an internal error.
8004	Eject Fail	E	F	An eject command has failed, either after you pressed the Eject button or after a host command. Action: Try forcing ejection.
2010	Eject Mag	I		The Eject button has been pressed.
1015	Erase	S		The drive is erasing data from the tape.
8000	`Error X`	E	F	The mechanism has jammed. The number *X* identifies the reason for the jam. Action: Press the Eject button to attempt to recover the cartridge and magazine. If the problem persists, note the value of *X* and call for service.
4003	ERROR: No tape in slot 1	I		There is no tape in slot 1. HP OBDR requires a tape in slot 1 from which it can boot.
4001	ERROR: Unable to boot from tape	I		The system cannot boot off the loaded tape.
1023	ForceEject	I		A forced ejection is in progress (see Forcing Ejection).
1014	Format	S		A SCSI command for generating a one- or two-partition tape is being executed, or the drive is changing the size of the partitions on an existing two-partition tape.
	FRU 1 Dead	E	O	The controller board for the drive mechanism in the autoloader has failed its self-test. Action: Call for service.
	FRU 2 Dead	E	O	The drive mechanism has failed its self-test Action: Call for service.
3002	FW Check	S		Firmware upgrade data is being checked for compatibility.
8024	FW Data Err	E	F	The autoloader has failed to upgrade the firmware because the new firmware is corrupt. Action: Obtain a good copy of the firmware upgrade.
3003	FW Program	S		The drive is being upgraded with the new firmware.
3005	FW Tape	I		The tape loaded is a firmware upgrade tape.
3001	FW Upgrade	S		Firmware upgrade data is being read from a cartridge.
8025	FW Read Fail	E	F	A firmware upgrade failed because of an error in reading data from the cartridge. Action: Try again. If it still fails, call for service.
8027	FW Tape Write Protected	E	F	A firmware upgrade failed because the cartridge is write-protected. Action: Change the write-protect switch on the cartridge and try again.
8026	FW Write Fail	E	F	A firmware upgrade failed because of an error in writing a modified upgrade count to the tape. Action: Try again. If it still fails, call for service.
	Illegal FW	E	F	The autoloader has failed to upgrade the drive firmware because the new firmware is incompatible. Action: Obtain a correct version of the firmware upgrade.
	Illegal HW	E	F	The autoloader has failed to upgrade the drive firmware because the new firmware is for incompatible hardware. Action: Obtain a correct version of the firmware upgrade.
2002	Insert Mag	S		The autoloader is waiting for you to insert a magazine.
8003	Load Fail: Try New Tape	E	F	A load command has failed, or a load or change partitions command has failed to read the system area of the tape, which stores information about tape usage. Action: Use a new cartridge.
8007	Load Fail: Press Eject	E	F	A load command has failed, or a load or change partitions command has failed to read the system area of the tape, which stores information about tape usage. Action: Press the Eject button.
1021	Load Lock	I		Manual loading is locked (Media Removal Prevented).
2009	Load Tape	I		This is displayed when you press the Load Cartridge button.
1003	Loading	S		Either a cartridge is being moved from the magazine and placed into the drive mechanism, or the drive is loading a cartridge.
1016	Locate	S		The drive is moving the tape to a point specified by the host.
1002	Mag Check	S		The autoloader is examining the magazine to determine which slots are occupied.
1001	Mag Eject	S		The autoloader is ejecting the magazine.
1006	Mag Loaded	S		A magazine is present in the autoloader, and the magazine check has been carried out.
8005	Media Removal Prevented	E	O	An eject command has been attempted after a `SCSI PREVENT MEDIUM REMOVAL` command has been sent by the host. Action: Try again when the media removal prevention has been removed. This can be achieved by the host sending a `SCSI ALLOW MEDIUM REMOVAL` command, or by resetting or power-cycling the autoloader.
3004	New FW!!!!	S		The firmware upgrade process has been successfully completed.
8016	No EODmark	E	F	The drive is trying to read what appears to be a blank cartridge (one with no DDS-format End of Data pattern). This is probably a result of power failure while writing.
4000	OBDR Mode	I/S	F	The drive has switched to HP One-Button Disaster Recovery mode and is restoring the operating system.
1017	Partition	S		The drive is switching to the other partition on a two-partition tape.
8017	Partition 1 too large	E	O	A command to format the tape has failed because the requested size for partition 1 is too large. Action: Try again with a smaller partition 1 or, if possible, a longer tape.
2007	Press Eject	I		Press the EJECT button.
1009	Read	S		The drive is reading data from the tape.
8012	Read Fail	E	F	A read has failed. The host should reposition and try again.
	Read Only	S		Loaded cartridge is write-protected. See the “`Ready xxm`” message.
	`Ready xxm`	S		A cartridge has been loaded in the DAT drive, and the drive is ready for tape motion commands. "`xxm`" is the length of the currently loaded cartridge. For example, "Ready 125m" will be displayed when a DDS-3 (125m) cartridge is loaded. If a write-protected cartridge is loaded, the "`Ready xxm`" message alternates with the "`Read Only`" message.
1013	Rewind	S		The drive is rewinding the tape to the beginning of the partition.
8020	SCSI Error	E	O	A SCSI command error has been detected. Action: Check the SCSI interface connection and try again.
	`SCSI ID: x`	I		This indicates the SCSI ID ("*x*") of the autoloader. During the power-on sequence, it is displayed for 2 seconds.
1012	Search <<	I		The drive is searching for a record, filemark, setmark, or BOD (Beginning of Data) towards the beginning of the tape (in SCSI terms, it is responding to a SPACE command with a negative Count field).
1011	Search >>	I		The drive is searching for a record, filemark, setmark, or EOD (End of Data) towards the end of the tape (in SCSI terms, it is responding to a SPACE command with a positive Count field).
1022	Select Lock	I		Tape Selection is locked (Media Removal Prevented).
2008	Select Tape	I		This is displayed when you press the Select button and for a short time after the button is released.
0000	Self Test	S		The autoloader is performing its power-on self-test.
1007	SemiLoaded	S		A cartridge is in the drive but not loaded (the tape has not been threaded).
2003	Stray Tape: Insert Empty Mag	I		There is a cartridge in the tape drive, but there is no magazine present to put it in. Action: Insert an empty magazine to retrieve the cartridge.
8006	Tape Fault	E	F	The cartridge in the drive is faulty, possibly because the tape has snapped, or the cartridge has an invalid pattern of identification holes. Action: Use a new cartridge and ensure that it is Media Recognition System. See Choosing Cartridges.
1024	Tape Full	E	O	A READ, SPACE, `WRITE` or `WRITE FILEMARKS` command encountered EOP (End of Partition) unexpectedly. When reading, this may mean the required data is on the next cartridge in the sequence.
8019	Tape has DC data	E	O	A READ command has encountered compressed data on the tape, and the drive is not currently configured to decompress data. The host may have disabled data compression, or configuration switch 2 (on the underside of the autoloader) may be off so the host's ability to control the drive's state is disabled. Action: Check that the host has not disabled data compression. Make sure that switch 2 is on by reconfiguring the drive using the configuration switches on the underside of the autoloader.
8013	Tape Position Lost	E	O	A `WRITE`, READ, SPACE or `REWIND` command has failed to complete. The tape is positioned on the far side of the bad groups of data. Action: Reposition and try again.
8008	Tape Stuck	E	F	The cartridge is stuck in the drive. Action: Try forcing ejection. If this fails, call for service.
4002	Unable to boot: Cleaning tape	I		The system cannot boot off a cleaning tape.
1004	Unloading	S		Either the drive is unloading a cartridge, or a cartridge is being ejected from the drive and replaced in the magazine.
8022	Upgrade Err	E	F	An error occurred upgrading.
8015	Worn Media	E	F	A high error rate has been detected while writing, suggesting that the cartridge is nearing the end of its useful life. Action: Copy any data you wish to keep from the cartridge onto a new cartridge and discard the old cartridge.
1010	`Write x.y:1`	S		The drive is writing data to tape. "`x.y:1`" is the cumulative compression ratio since power-on, or since the compression ratio was last cleared. For example, "`Write 2.1`" means a compression ratio of 2.1:1. The compression ratio is only displayed after about 1 megabyte of data has been written since power-on.
8010	Write Fail	E	F	A `WRITE`, `WRITE FILEMARK` or ERASE command has failed. Action: Use a new cartridge.
8003	Write Fail: Clean or Use New Tape	E	F	The drive could not write to the tape. The tape is possibly worn or damaged.
8018	Write Protected Tape	E	F	A `WRITE`, `WRITE FILEMARK` or ERASE command has been attempted on a write-protected cartridge. Action: Remove the cartridge and change it to write-enabled.
8023	Wrong FW	E	F	The upgrade firmware is not compatible. The drive has not been programmed.

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autoloader modes of operation

contents of this section

- types of mode
- stacker mode
- random mode
- changing modes

types of mode

The HP Surestore DAT 24x6 and DAT 40x6 may be operated in either stacker or random mode. Mode is initially determined by what happens after you insert a magazine:

- If the host sends a command (`MOVE MEDIUM`) to move a cartridge from the magazine to the drive, the autoloader goes into random mode.
- If you select a cartridge by pressing the Select button and then load it by pressing the Load Cartridge button, the autoloader goes into stacker mode.

stacker mode

In stacker mode (also known as sequential mode), the autoloader simply uses the cartridges sequentially from the magazine. When one cartridge is unloaded (following a `SCSI UNLOAD` command), the autoloader automatically loads the cartridge from the next highest numbered magazine slot.

You can select the first cartridge you want the autoloader to load by using the Select and Load Cartridge buttons on the front panel.

random mode

In random (or changer) mode, the host computer controls the movement of cartridges between magazine and drive. For example, suppose the cartridge from slot 3 is currently loaded and you want to restore a particular file from a particular backup. The software knows that the file is on tape 1, so the host instructs the autoloader to replace cartridge 3 in the magazine and then loads cartridge 1 so that it can restore the file. As a user, you may not even be aware that the cartridge has been changed.

Use of random mode requires two things:

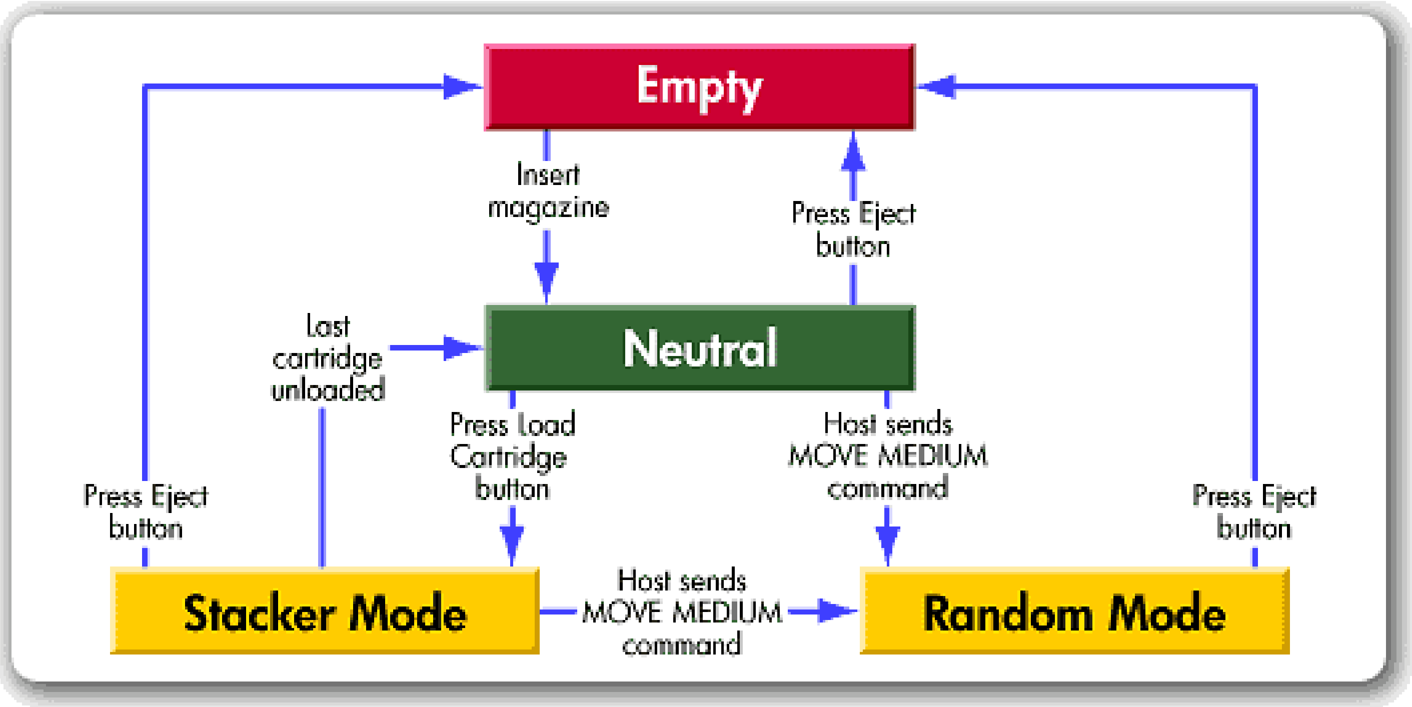
- The host computer must be able to support multiple LUNs (Logical Unit Numbers), by which it identifies different devices at a single SCSI address, so that it can send commands separately to the changer mechanism and the DAT drive in the autoloader.
- The software must be able to provide the necessary functionality.

changing modes

The flowchart below shows how the autoloader moves between four states:

- Empty, when there is no magazine in the autoloader.
- Neutral, when a magazine has been inserted but no cartridges have been moved to the DAT drive and no commands have been received to move a cartridge. It is while the autoloader is in the neutral state that you can select a cartridge for loading using the Select button.
- Stacker mode
- Random mode

The diagram is simplified. In particular, it does not show how the situation is altered if the host computer cannot address multiple LUNs at a single SCSI address.



dat tape drive user's guide

cartridge care

contents of this section

- choosing cartridges
- cartridge compatibility by model
- caring for cartridges
- using cartridges
- storing cartridges
- maximizing tape life
- avoiding condensation

related topics

- write-protecting cartridges
- labeling cartridges
- loading and unloading cartridges
- ordering cartridges

choosing cartridges

Only rely on the best media to protect your valuable data. Thanks to HP's rigorous testing programs, HP Surestore DDS data and cleaning cartridges are the safest investment you can make.

HP is not only the leader in tape backup but also the leading supplier of DDS cartridges. HP DDS cartridges are designed to meet the exacting mechanical, environmental and durability specifications of data storage applications. They undergo more than 600,000 hours of rigorous testing and are designed to withstand 2,000 passes or 100 full backups. And because HP DDS cartridges are inexpensive, they give DAT the lowest overall cost of ownership of all backup technologies.

To avoid loss of data and damage to your drive, use only cartridges that bear the DDS logo. DAT cartridges are for audio use and should not be used for data storage. To identify data-grade tapes, look for the DDS logo on the cartridge.

Although the logo may be used by any media manufacturer whose tapes meet the DDS specification, Hewlett-Packard recommends that you use HP DDS cartridges with your HP tape drive. Hewlett-Packard cartridges have been designed and tested to give maximum data reliability and mechanical durability. See ordering supplies for part numbers and descriptions.

Order online at: www.hp.com/go/storagemedia.

Caution: Use only DDS cartridges in the drive. Do not use cartridges labeled "DAT" because the media is not certified and its integrity cannot be guaranteed for data storage purposes. DAT cartridges have a different mechanical specification that can cause them to jam in the mechanism. The tape drive warranty does not cover damage caused by the use of DAT cartridges.

cartridge compatibility by model

For optimum performance and storage capacity, use tape cartridges that match your drive's format, and normally use only one cartridge per day.

- HP Surestore DAT 24 drives and DAT 24x6 autoloaders use DDS-3 cartridges.
- HP Surestore DAT 40 drives and DAT 40x6 autoloaders use DDS-4 cartridges.

HP Surestore DAT drives are backward compatible, however, which means that a DDS-3 drive can read and write DDS-2 tapes, but a DDS-2 drive cannot use a DDS-3 tape. The compatibility between drive models and cartridges is summarized in the table below. However, please note that although HP Surestore DAT drives and autoloaders are fully backward compatible, old tape formats are more abrasive than later generations and using older tape formats can reduce the life expectancy of the device. On an autoloader, if you must use older formats, do not mix DDS-2 (120m) or DDS-3 (125m) with DDS-4 (150m) cartridges.

Cartridge Type:	DDS-1 90m cartridges	DDS-2 120m cartridges	DDS-3 125m cartridges	DDS-4 150m cartridges
Native Capacity:	2 GB	4 GB	12 GB	20 GB
Capacity Assuming 2:1 Compression:	4 GB	8 GB	24 GB	40 GB
HP Surestore DAT 24	✓	✓	✓	
HP Surestore DAT 40	✓	✓	✓	✓
HP Surestore DAT 24x6	✓ read only	✓	✓	
HP Surestore DAT 40x6	✓ read only	✓	✓	✓

caring for cartridges

Under optimum environmental conditions, Hewlett-Packard DDS-2, DDS-3 and DDS-4 cartridges are currently specified to 2000 passes over any part of the tape. In operational terms, this can be translated to about 100 backup operations. Under severe environmental conditions, particularly where the tape drive is used at very low humidity or if certain areas of the tape are accessed frequently, the number of backup operations should be limited even further.

Caution: Ensure that only one label is stuck to the label area of the cartridge. Never use non-standard labels, and never stick anything to the cartridge other than in the label area.

using cartridges

- Only use DDS cartridges in temperatures in the tape drive's operating range from 5°C to 40°C (40°F to 104°F) and 20 to 80% relative humidity (noncondensing).
- If you expose cartridges to temperatures outside the operating limits, stabilize them before you use them. To do this, leave the cartridges in the operating environment for 24 hours.
- Only use media for the recommended number of times (DDS-3 and DDS-4 = 100 times). Overuse of the tape will cause it to degrade and possibly shed tape debris in the drive. Too many new tapes can also cause wear of the drive as they are rougher than used ones.

- Use mostly the latest media type (for example, DDS-4 media for an HP Surestore DAT 40x6 drive or autoloader).
- Do not verify (DDS does read-after-write checking automatically)
- Do not overload the computer during backups. Maximize the transfer rate (run overnight with no other processes) and use incremental backups if convenient.
- Do not overuse your tape drive or autoloader—tape drives are designed for approximately three hours of tape pulling per day, not constant usage; autoloaders are designed for approximately four hours—and clean the drive regularly.
- Do not bulk erase DDS format cartridges.

storing cartridges

Tests show that data can successfully be stored on DDS cartridges for 30 years or more if stored under proper conditions:

- Store cartridges at temperatures -40°C and 45°C (-40°F and 113°F) with a relative humidity between 5 and 95%.
- Always keep the cartridges in a clean environment.
- Always store cartridges in their plastic cases when not in use.

maximizing tape life

- Do not touch the tape surface.
- Do not attempt to clean the tape path or tape guides inside the cartridge.
- Do not leave cartridge tapes in excessively dry or humid conditions.
- Do not leave cartridges in direct sunlight or in places where magnetic fields are present (for example, under telephones, next to monitors or near transformers).
- Do not drop cartridges or handle them roughly.
- Stick labels onto the label area only.
- See the insert included with the tape cartridge for storage conditions.

avoiding condensation

Condensation can be a problem for tape drives and cartridges. To minimize the chance of condensation, stay within the specifications for using and storing cartridges above and observe the following guidelines:

1. Position the drive where the temperature is relatively stable -- away from open windows, heat sources and doors.
2. Avoid leaving cartridges in severe temperature conditions, for example, in a car standing in bright sunlight.
3. Avoid transferring data (reading from and writing to cartridges) when the temperature is changing by more than 10°C (18°F) per hour.
4. If you bring a cold tape drive or tape cartridge into a warm room, allow time for it to warm to room temperature before using it. For example, if you have moved the drive from a cold car to a warm room, allow time for the drive to reach room temperature (up to 24 hours if the temperature change is extreme).

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labeling and write-protecting cartridges

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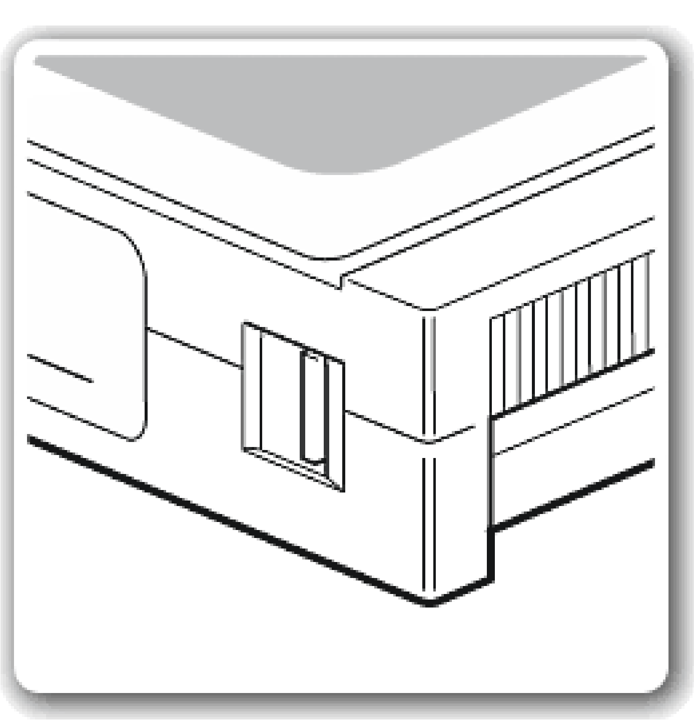
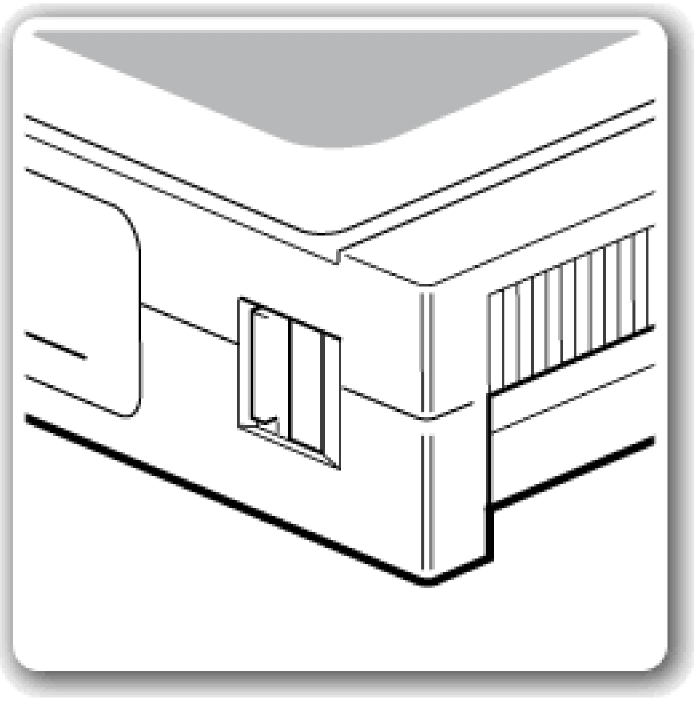
to write-protect a cartridge

If you want to protect the data on a cartridge from being altered or overwritten, you can write-protect the cartridge.

Caution: Write-protection will not prevent a cartridge being erased by bulk-erasure or degaussing. **Do not bulk erase DDS format cartridges.** This will destroy pre-recorded servo information and render the cartridge unusable.

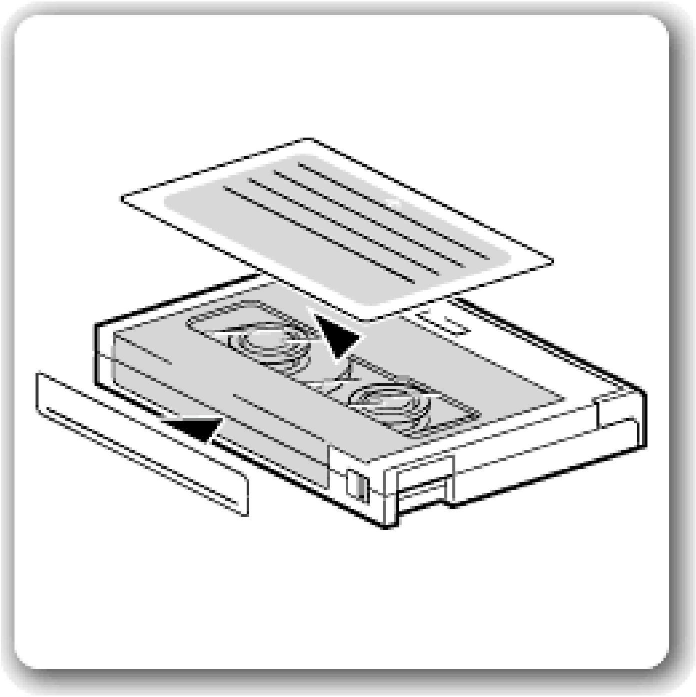


To write-protect a cartridge, slide the tab on the rear of the cartridge so that the recognition hole is closed.



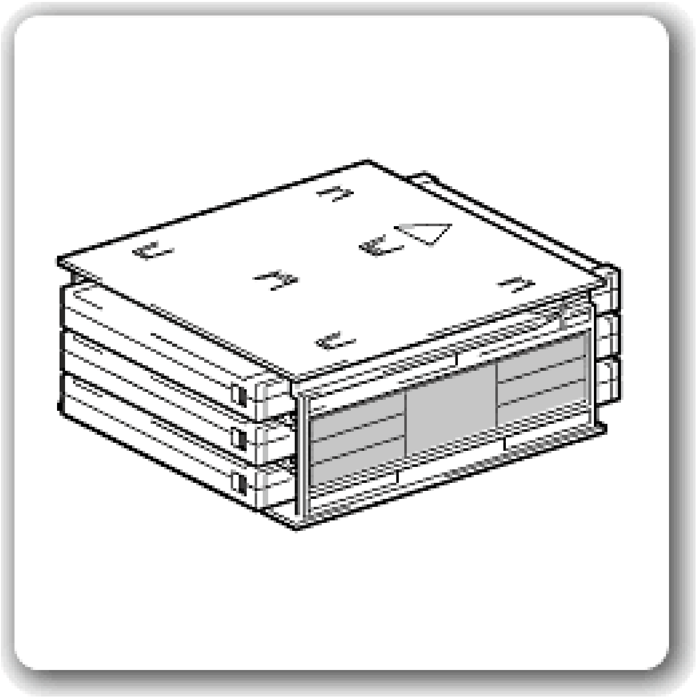
To write-enable a cartridge, slide the tab back so that the hole is open, before loading the cartridge into the drive.

to label a cartridge



Use HP DDS cartridges with your drive. Never use non-standard labels, and never stick anything to the cartridge other than in the label areas, as illustrated. Do not stick more than one label onto each label area; extra labels can cause the cartridges to jam in the tape drive.

to label a magazine



Make sure that the magazine label is stuck firmly in the recessed label area on the side of the magazine, as illustrated. If the label is stuck somewhere other than in the label area, the magazine may jam in the mechanism.

Ensure that the corners of cartridge and magazine labels stick firmly to the surface and do not curl at their edges.

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cleaning

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  - manual method
  - automatic method

cleaning strategy

Cleaning the drive's tape heads regularly with a cleaning cartridge is important to maintain the integrity of your backup data. For optimum performance and to prevent the loss of data, HP recommends that you incorporate a cleaning cycle into your backup routine.

As a general guideline, you should clean the tape heads after every fifth backup cartridge. You should also clean the tape heads if the media caution signal (flashing amber light) is displayed on a tape drive or the 'Clean Me' message is displayed on an autoloader.

HP Surestore Tape DAT 24, DAT 40, DAT 24x6 and DAT 40x6 models all have an internal head cleaner. The models also support TapeAlert, which will send a message to your backup software when the tape heads need cleaning. You will only get these messages if your backup software supports TapeAlert.

HP Surestore Tape DAT 40 and DAT 40x6 feature many improvements to keep the tape path and heads as clean as possible. Therefore, they will require less cleaning than previous models. However, we still recommend, as a general guideline, cleaning the HP Surestore Tape DAT 40 and DAT 40x6 every fifth backup.

cleaning cartridge

Use only an HP cleaning cartridge (part number C5709A) to clean the tape heads. Do **not** use swabs or other means of cleaning the heads. The cleaning cartridge uses a special tape to clean the tape heads. A cleaning cartridge can only be used 50 times or as instructed on the cartridge packaging. Always place a check mark in a box each time you use the cartridge to clean the drive. Replace the cleaning cartridge when all the boxes are checked.

cleaning the tape heads on a drive

1. Insert a cleaning cartridge into the drive. The tape drive automatically loads the cartridge and cleans the heads.
   At the end of the cleaning cycle, the drive ejects the cartridge. The cleaning cycle takes approximately 30-60 seconds. If the cleaning cartridge ejects in less than 20 seconds, it has probably expired. In this case, discard the cleaning cartridge and repeat the operation with a new one.
2. Remove the cleaning cartridge from the drive.

Note: The drive's TapeAlert feature will send a message to your backup application when the tape heads need cleaning or a cleaning cartridge has expired.

cleaning the tape heads on an autoloader

In addition to regular cleaning, use a cleaning cartridge under the following circumstances:

- When a "Clean Me" message is displayed on the front panel and the Operator Attention Required light flashes amber.
- When your backup application warns you that the drive needs cleaning (providing your backup application supports the TapeAlert feature).

Cleaning the tape heads on an HP SureStore DAT 24x6 and DAT 40x6 autoloader can be performed manually by the user or automatically by the backup application.

manual method

1. Place a cleaning cartridge in any magazine slot and note the slot number.
2. Insert the magazine into the autoloader.
3. Press the Select button until the slot number where the cleaning cartridge is located is displayed.
4. Press the Load Cartridge button to load the cleaning cartridge into the drive. The drive will then automatically perform the cleaning cycle. The LCD display will display the message "Cleaning" while the cartridge is in use.
5. Eject the magazine and mark the label on the cleaning cartridge to keep a record of how many times it has been used.

automatic method

Certain backup applications that provide autoloader support have provision for automatic use of the cleaning cartridge. In this case the cleaning cartridge is put in a magazine slot (usually slot 6). The application can then be told that slot 6 contains the cleaning cartridge and also when it is to be used. The magazine is then loaded in the usual way and the cleaning cartridge is used at intervals programmed into the application.

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hp one-button disaster recovery

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before you use hp obdr

HP One-Button Disaster Recovery is a standard feature on all HP Surestore DAT tape drives. It is also available with the HP Surestore DAT 40x6 autoloader, but not with the HP Surestore DAT 24x6 autoloader. **However, it can only be used with specific configurations.**

- To check whether your system (hardware, operating system and backup software) is OBDR-compatible, please refer to our World Wide Web site www.hp.com/go/connect.
- To download firmware upgrades and find detailed troubleshooting information, please refer to our World Wide Web site www.hp.com/support/datOBDR.

Note: HP OBDR is not applicable to HP-UX and other non-Intel UNIX operating systems, and it is not compatible with Intel-based Solaris systems.

If your system does not support HP One-Button Disaster Recovery, you can still use your tape drive normally to back up and restore data. However, you must remember to create a separate set of emergency recovery disks for your operating system whenever you change your system configuration.

what is hp obdr

HP One-Button Disaster Recovery, OBDR, is the easiest-to-use disaster recovery solution on the market. Using just the tape drive and the most recent backup cartridge you can recover from hard disk failure, data corruption, viruses and like-for-like hardware replacement. The touch of one button restores the operating system, configuration, applications and data files to their status at the time the backup cartridge was made.

When you run HP One-Button Disaster Recovery, your tape drive goes through the following sequence:

- It goes into a special disaster recovery mode that enables it to restore your operating system and reboot. It acts like a bootable CDROM. (Your system's ability to boot from CDROM is normally enabled by default. If you have changed this setting, you will need to enable it again. Refer to your system BIOS manual for further details.)

- It returns to normal tape drive mode and restores the data.

types of system disaster

HP One-Button Disaster Recovery allows you to recover from the following types of system disaster:

- Hard disk failures, as long as the replacement hard disk is the same size or larger than the original and uses the same interface (for example, replace a SCSI hard disk with another SCSI disk)

- File corruption because of an operating system error

- File corruption because of an application software error

- Viruses that prevent you from booting your system correctly

- User errors that stop you from booting your system correctly

- Hardware failures where the server is replaced by an identical component (for example: NetServer LC2000 (SCSI) is replaced with another NetServer LC2000 of exactly the same configuration)

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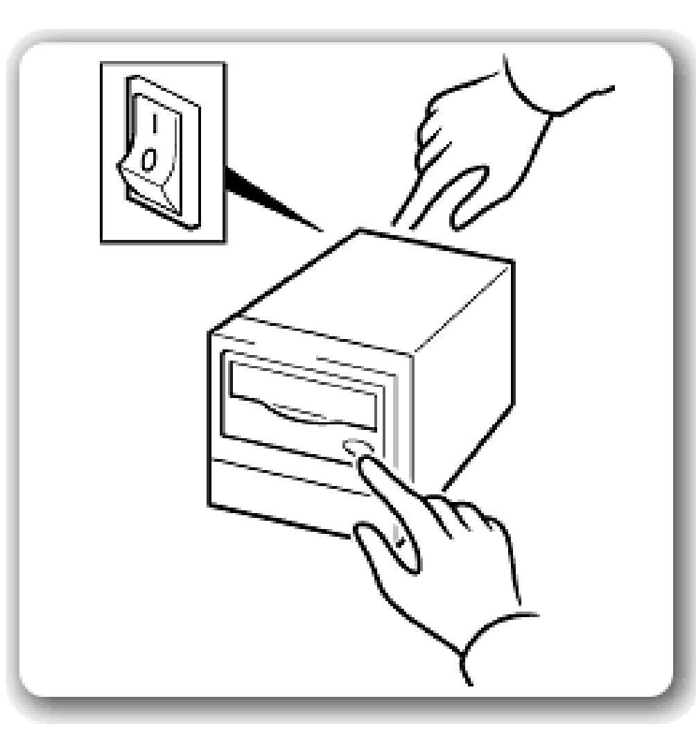
hp obdr with external drives

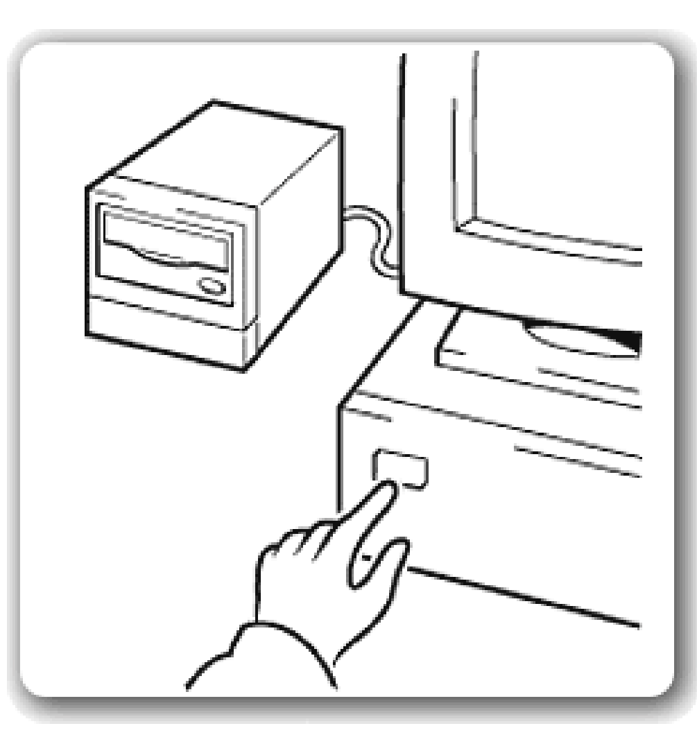
Check our World Wide Web site (www.hp.com/support/datOBDR) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

1. Hold down the eject button. Keeping the eject button pressed down, power on your tape drive. This puts the device into HP One-Button Disaster Recovery mode when you power on. (If there is a cartridge in the tape drive, you can leave it there.)

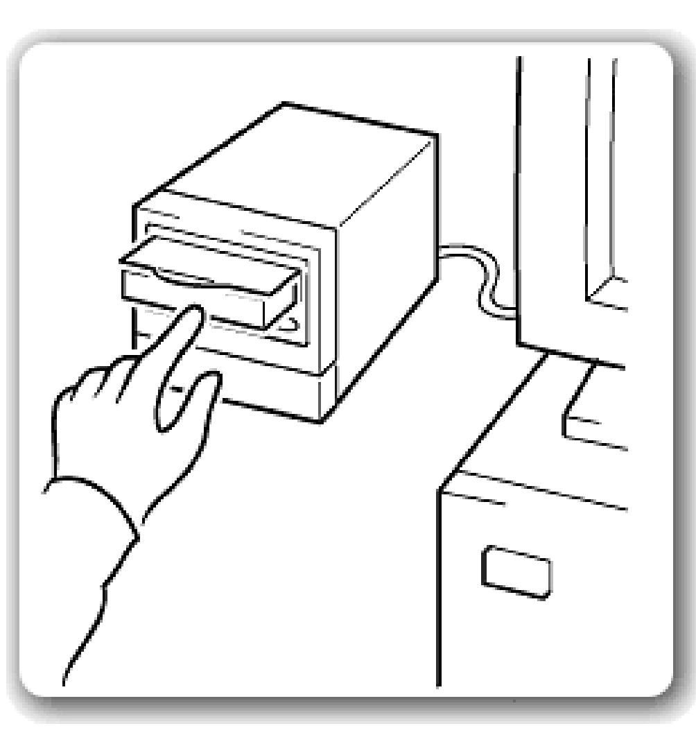
   Release the button as soon as the amber and green LEDs flash alternately.



2. Switch on your computer system.



3. If there is no cartridge in the tape drive, immediately insert the latest one. This activates the HP One-Button Disaster Recovery process. Both LEDs will flash alternately while the tape drive restores your operating system to a state where it can run a normal data restore.



4. Follow the on-screen instructions to set up the operating system. Normally, you can accept the default response to all the prompts, for example just press <Return>.

   Once the operating system has been set up and rebooted, the tape drive's LED changes to constant green, and you can remove the cartridge if you wish.

5. You are now ready to run a normal data restore. Follow the normal process for your restore application.

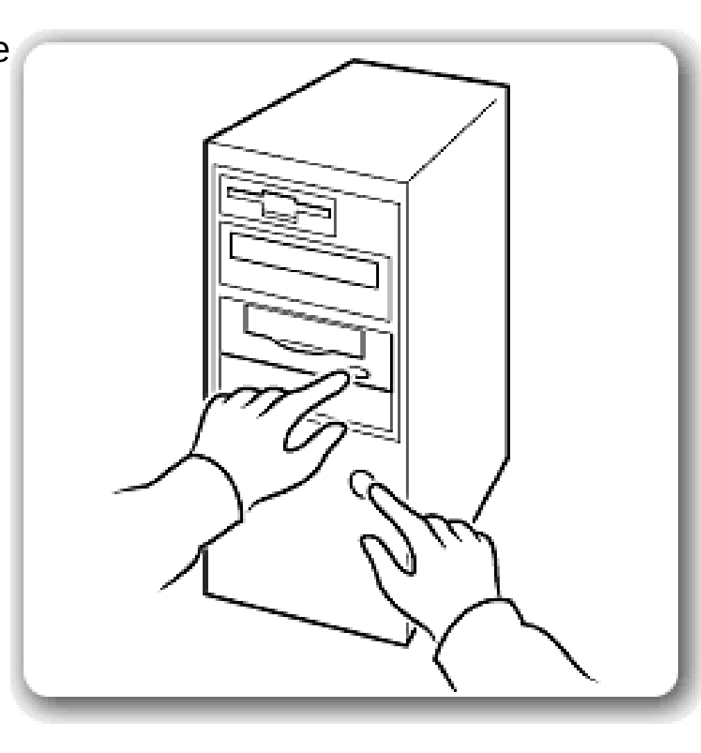
   If the restore fails for any reason, refer to our Support web site.

hp obdr with internal drives

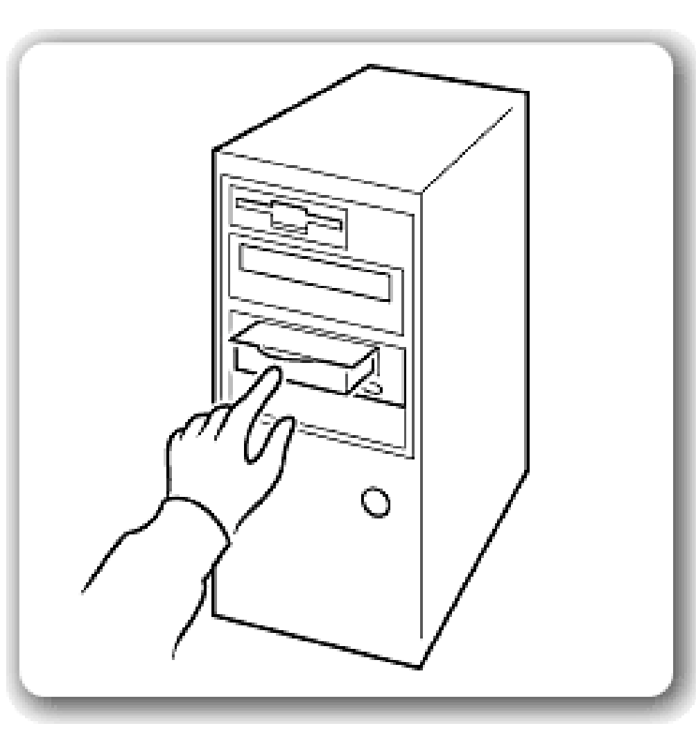
Check our World Wide Web site (www.hp.com/support/datOBDR) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

1. Hold down the eject button. Keeping the eject button pressed down, power on your computer system. This puts the device into HP One-Button Disaster Recovery mode when you power on. (If there is a cartridge in the tape drive, you can leave it there.)

   Release the button as soon as the amber and green LEDs flash alternately.

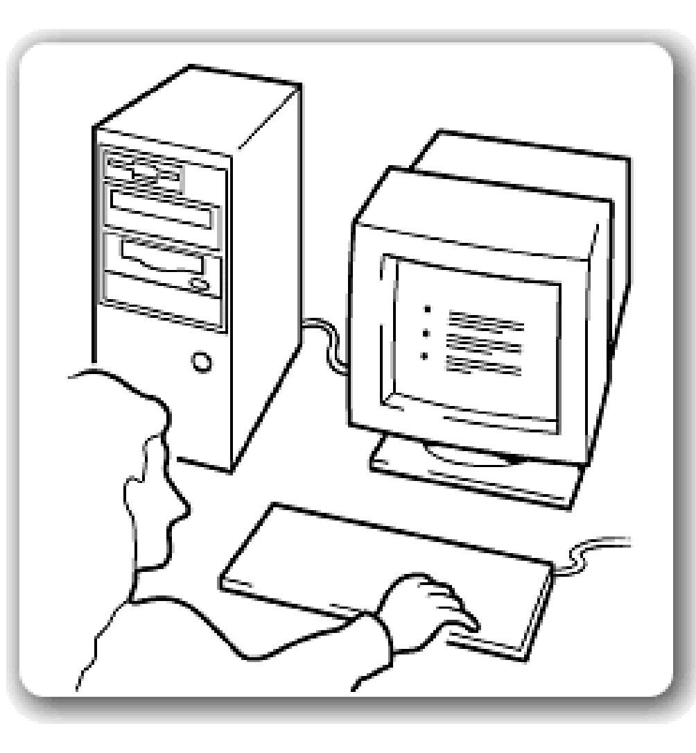


2. If there is no cartridge in the tape drive, immediately insert the latest one. This activates the HP One-Button Disaster Recovery process. Both LEDs will flash alternately while the tape drive restores your operating system to a state where it can run a normal data restore.



3. Follow the on-screen instructions to set up the operating system. Normally, you can accept the default response to all the prompts, for example just press <Return>.

   Once the operating system has been set up and rebooted, the tape drive's LED changes to constant green, and you can remove the cartridge if you wish.



4. You are now ready to run a normal data restore. Follow the normal process for your restore application.

   If the restore fails for any reason, refer to our Support web site.

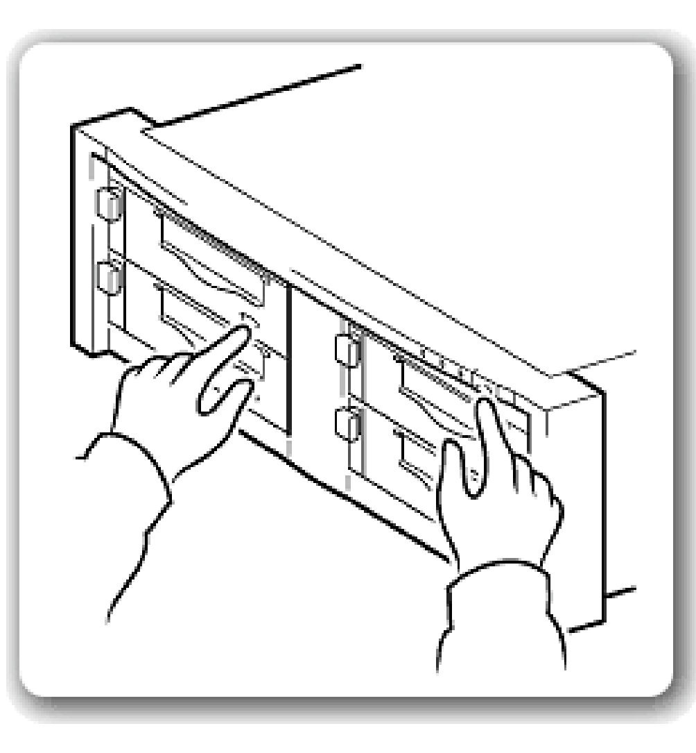
hp obdr with removable drives

Check our World Wide Web site (www.hp.com/support/datOBDR) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

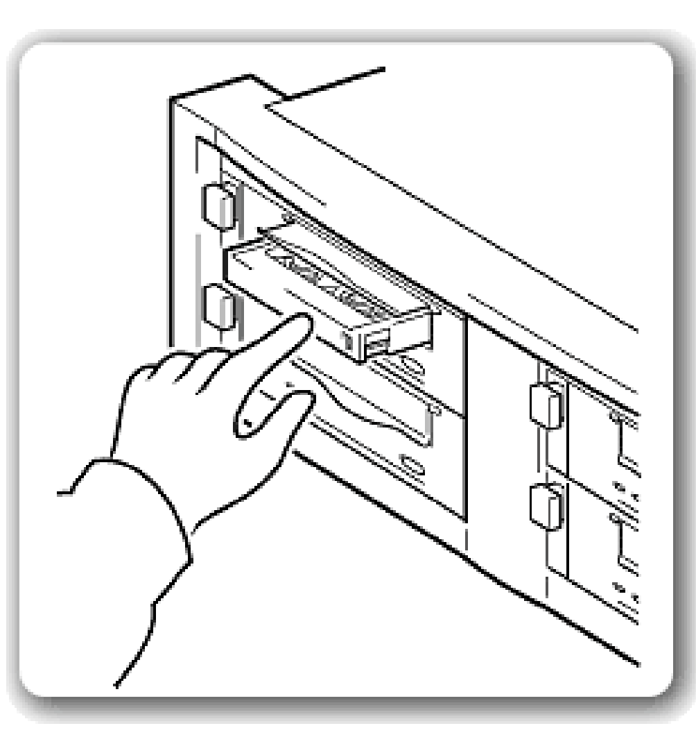
You use your backup software to assign which tape drive in the tape array will be used for HP OBDR.

1. Hold down the eject button of the tape drive that you have assigned for HP OBDR. Keeping the eject button pressed down, power on your tape rack and computer system.

   Release the button as soon as the amber and green LEDs flash alternately.

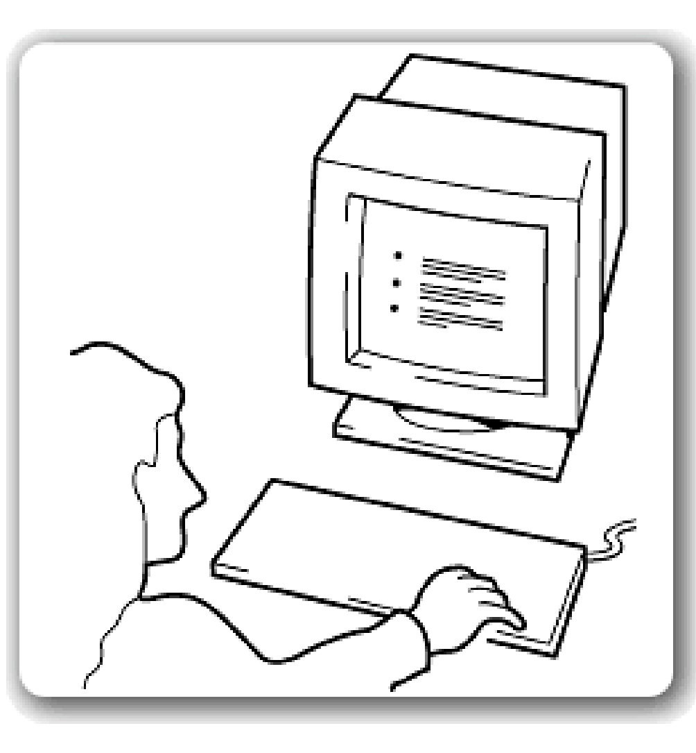


2. If there is no cartridge in the tape drive, immediately insert the latest one. This activates the HP One-Button Disaster Recovery process. Both LEDs will flash alternately while the tape drive restores your operating system to a state where it can run a normal data restore.



3. Follow the on-screen instructions to set up the operating system. Normally, you can accept the default response to all the prompts, for example just press <Return>.

   Once the operating system has been set up and rebooted, the tape drive's LED changes to constant green, and you can remove the cartridge if you wish.



4. You are now ready to run a normal data restore. Follow the normal process for your restore application.

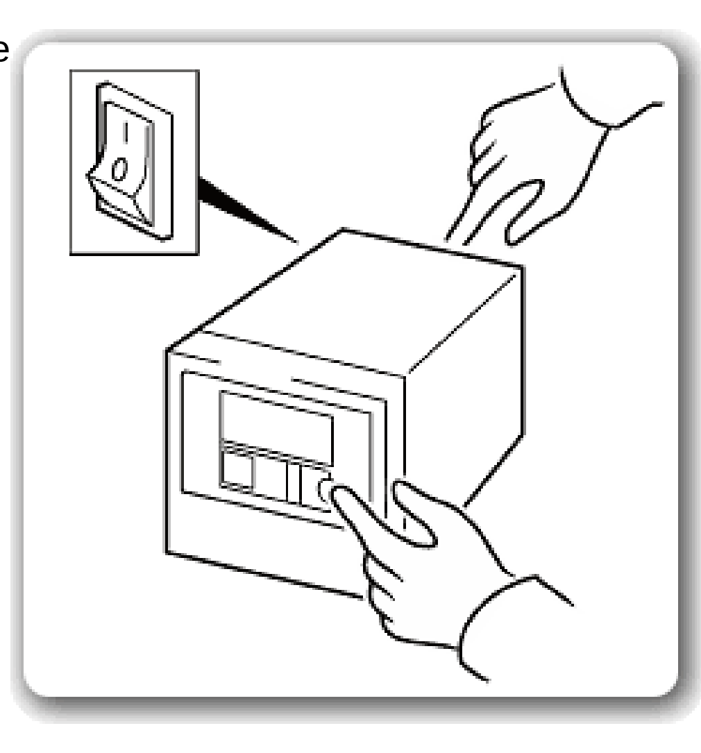
   If the restore fails for any reason, refer to our Support web site.

hp obdr with external autoloaders

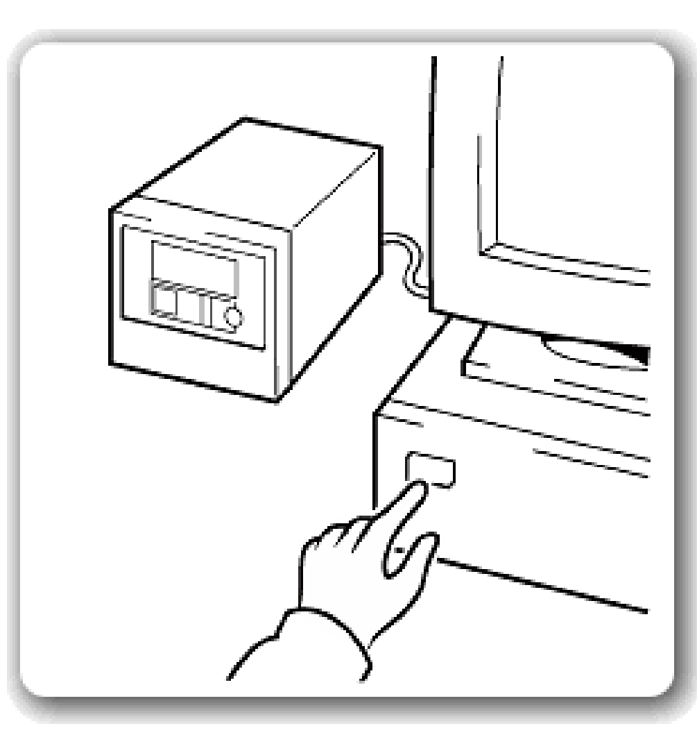
HP OBDR is only available with HP Surestore DAT 40x6 autoloaders. Check our World Wide Web site (www.hp.com/support/datOBDR) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

1. Hold down the eject button. Keeping the eject button pressed down, power on your autoloader. This puts the device into HP One-Button Disaster Recovery mode when you power on. (If there is a magazine in the autoloader, you can leave it there.)

   Release the button as soon as the LCD displays the message "OBDR Mode".

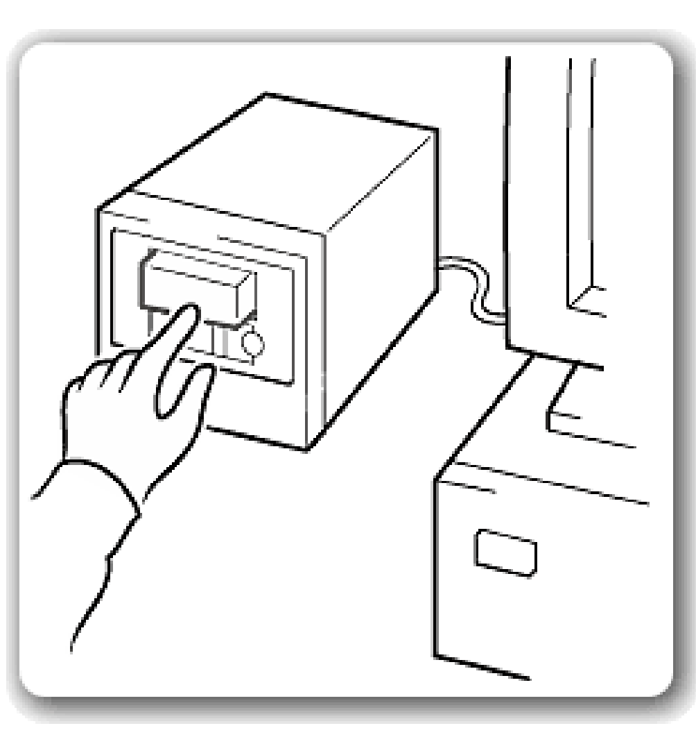


2. Switch on your computer system.



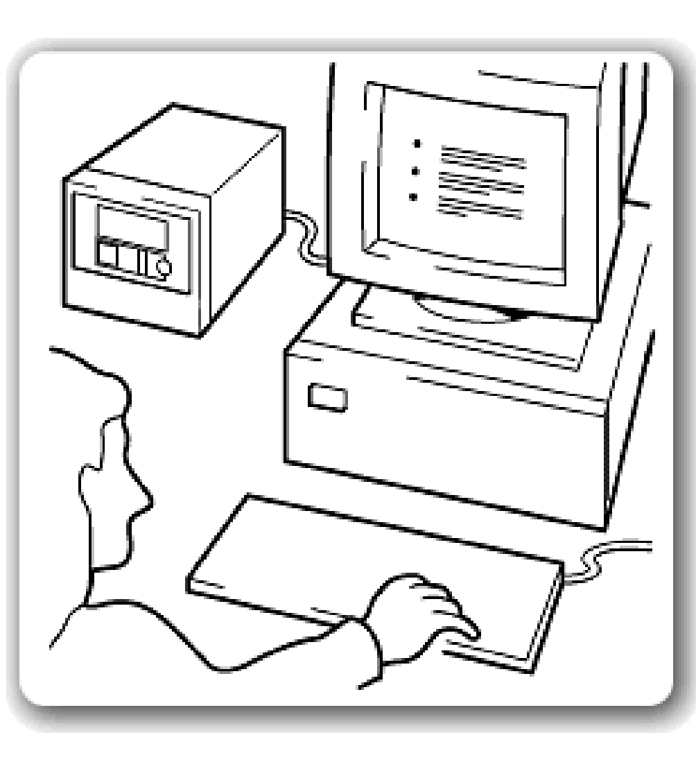
3. If there is no magazine in the autoloader, immediately insert the latest one. This activates the HP One-Button Disaster Recovery process. The LCD displays the message "OBDR Mode" (as described in step 1) while the autoloader restores your operating system to a state where it can run a normal data restore..

   Note: The cartridge in slot 1 of the magazine is always used to restore your operating system to a state where it can run a normal data restore from the most recent backup cartridge in the magazine.



4. Follow the on-screen instructions to set up the operating system. Normally, you can accept the default response to all the prompts, for example just press <Return>.

   Once the operating system has been set up and rebooted, the LCD "OBDR Mode" message disappears and the Magazine Present and Tape Activity LEDs changes to constant green.



5. You are now ready to run a normal data restore. Follow the normal process for your restore application.

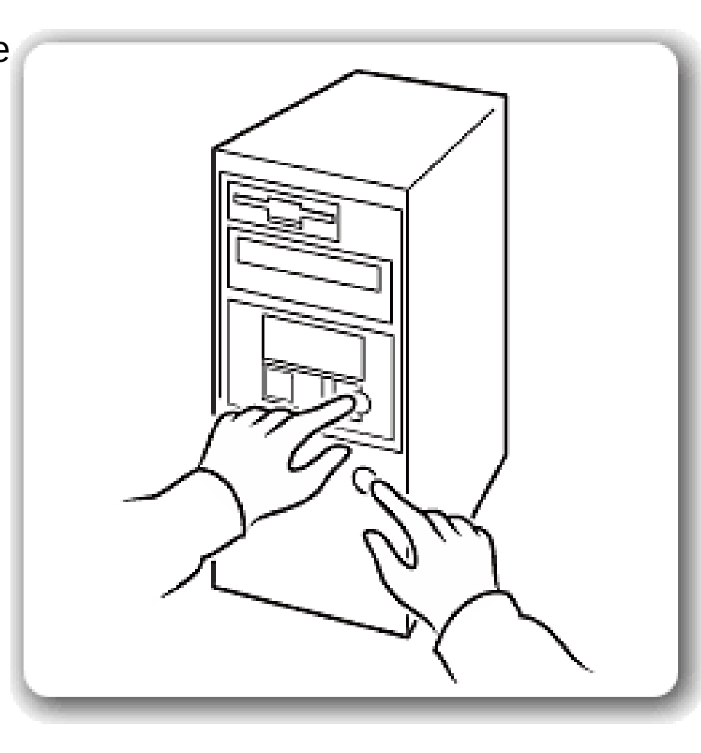
   If the restore fails for any reason, refer to our Support web site.

hp obdr with internal autoloaders

HP OBDR is only available with HP Surestore DAT 40x6 autoloaders. Check our World Wide Web site (www.hp.com/support/datOBDR) for the latest information about firmware upgrades and troubleshooting before you use HP OBDR.

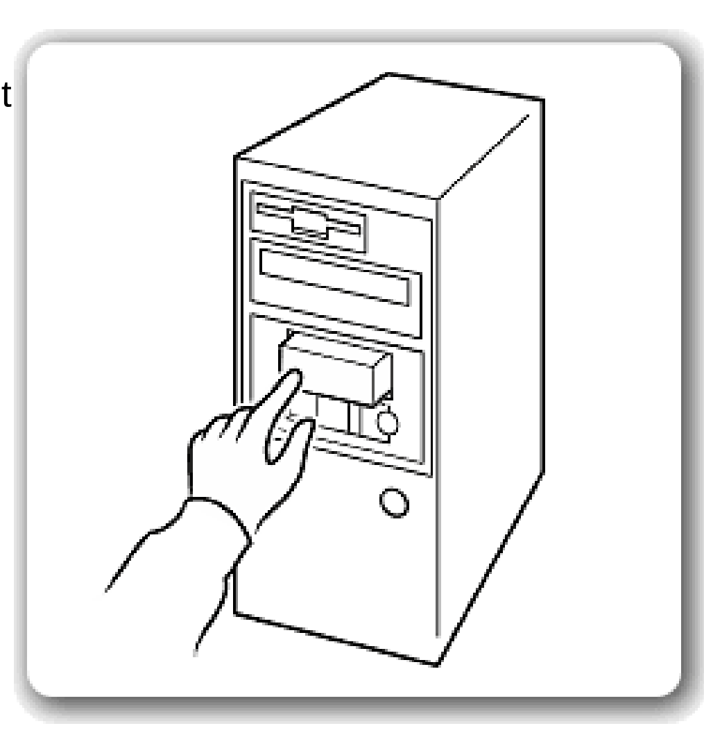
1. Hold down the eject button. Keeping the eject button pressed down, power on your computer system. This puts the device into HP One-Button Disaster Recovery mode when you power on. (If there is a magazine in the autoloader, you can leave it there.)

   Release the button as soon as the the LCD displays the message "OBDR Mode".



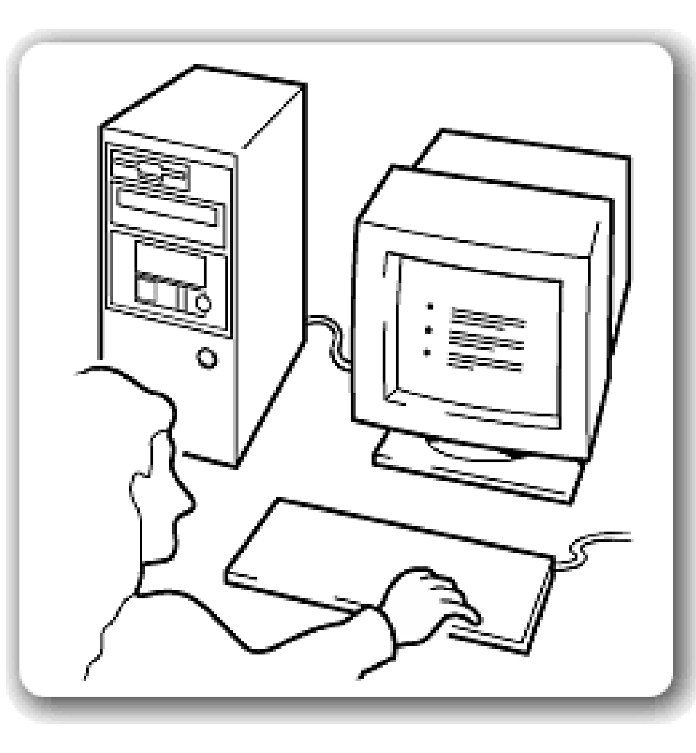
2. If there is no magazine in the autoloader, immediately insert the latest one. This activates the HP One-Button Disaster Recovery process. The LCD displays the message "OBDR Mode" (as described in step 1) while the autoloader restores your operating system to a state where it can run a normal data restore.

   Note: The cartridge in slot 1 of the magazine is always used to restore your operating system to a state where it can run a normal data restore from the most recent backup cartridge in the magazine.



3. Follow the on-screen instructions to set up the operating system. Normally, you can accept the default response to all the prompts, for example just press <Return>.

   Once the operating system has been set up and rebooted, the LCD "OBDR Mode" message disappears and the Magazine Present and Tape Activity LEDs changes to constant green.



4. You are now ready to run a normal data restore. Follow the normal process for your restore application.

   If the restore fails for any reason, refer to our Support web site.

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- BIOS upgrades on older Kayaks
- setting up early Adaptec cards
- setting up early Symbios cards
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  - while restoring other OS
  - while restoring data
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  - NT file system corrupted
- if the backup cartridge is ejected
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- restoring onto RAID configurations
- restoring onto servers with utility partitions

identifying your Adaptec card

You can identify whether you have a REVA or REVB version of the Adaptec card by looking at the markings on the large chip AIC-7880P. They should be similar to the following:

ADAPTEC AIC-7880P BQEA831 xxxxxx xxxxxxx	**The first letter in this line identifies the revision of the chip.** In this example, "BQEA831" means rev. B (from the first letter).

enabling obdr on older systems

If you have:

- A system that was shipped prior to 1st May 1999
- An earlier version of the Adaptec or SCSI adapter card

you may still be able to enable Disaster Recovery, by upgrading the BIOS firmware.

Caution
The next section describes how to upgrade BIOS. However, if you have any concerns about carrying out this upgrade, contact HP Support who will be happy to guide you through the process.

BIOS upgrades on older Kayaks

You will be able to upgrade the BIOS for older versions (shipped prior to 1st May 1999) of the following systems so that they provide full support for One-Button Disaster Recovery:

- Kayak XA (kayakXA.exe)
- Kayak XU/XW (kayakXU.exe)

The HP Surestore Tape CD contains special BIOS upgrade programs for these systems. Locate the appropriate BIOS upgrade program now, and follow these instructions.

1. Insert a blank, formatted, bootable DOS floppy disk in the floppy disk drive. (Note: You can only make suitable disks on DOS or Windows 95 systems. You cannot create one from within Windows NT.)
2. The BIOS upgrades are specific to the model of computer. Run the correct one for your system. Follow the on-screen instructions, which will guide you through the process of setting-up the BIOS update on the floppy disk.
3. Reboot the system from the floppy disk and follow the instructions in the README file on the floppy disk.

With very old versions of the Kayak (no LCD panel), you can enable Disaster Recovery from the Adaptec BIOS Setup program, see next section.

Disaster Recovery is already enabled on obsolete versions of the NetServer E, LC and LD series; for example, E40, E45, E50, LC, LC2, LDPrn.

setting up early Adaptec cards

It is highly recommended that you update your Adaptec card to the latest BIOS revisions. The HP Surestore CDROM contains:

- v2.20 BIOS update for the AHA2940UW (2940uw.exe)
- v2.11 BIOS update or higher for the AHA2940U2W (2940u2w.exe)

Perform the upgrade by following these instructions:

1. Insert a blank, formatted, bootable DOS floppy disk in the floppy disk drive. (Note: You can only make suitable disks on DOS or Windows 95 systems. You cannot create one from within Windows NT.)
2. From the above list, click on the Adaptec card type you wish to upgrade, and then follow the on-screen instructions which will guide you through the process of setting-up the BIOS update on the floppy disk.
3. Reboot the system from the floppy disk and follow the instructions in the README file on the floppy disk.

Adaptec SCSI cards with version 1.25 BIOS or above can support Disaster Recovery, but this option is disabled by default. To enable disaster recovery, you must run the built-in setup utility during the system's boot process:

1. Boot up the system.
2. When you see the Adaptec prompt for the adapter into which the tape drive is plugged, press <Ctrl><A> to go into the Adaptec BIOS settings. This will enter the Adaptec SCSI BIOS setup utility.
3. Select "Configure/View Host Adapter Settings".
4. Select "Advanced Configuration Options".
5. Ensure the following options are enabled:
   i) Host Adapter BIOS
   ii) BIOS Support for Bootable CD-ROM
   iii) BIOS Support for Int13 Extensions
   iv) Reset SCSI bus at IC Initialisation

Old versions of HP Kayak (no LCD panel): you must enable the Adaptec SCSI BIOS for the 8-bit SCSI channel to which the tape drive should be attached:

1. Boot the system.
2. During the boot process, you will see the Adaptec prompt for the adapter into which the tape drive is plugged. Press <Ctrl><A> immediately. This will enter the Adaptec SCSI BIOS setup utility.
3. Go to the "Advanced " menu.
4. Select "Ultra SCSI (8-bit) and press <Enter>.
5. Enable the "Option ROM Scan" item.
6. Press <Esc> twice and select "Exit Saving Changes".

setting up early Symbios cards

Older versions of the Symbios SCSI host adapter:SYM-8751SPE require BIOS upgrade to version 4.13.02. This enables One-Button Disaster Recovery on systems with multiboot capability:

The HP Surestore Tape CD contains a special BIOS upgrade program for Symbios cards (symbios.exe). Locate the appropriate BIOS upgrade program now, and follow these instructions.

1. Insert a blank, formatted, bootable DOS floppy disk in the floppy disk drive. (Note: You can only make suitable disks on DOS or Windows 95 systems. You cannot create one from within Windows NT.)
2. The BIOS upgrades are specific to the model of computer. Run the correct one for your system. Follow the on-screen instructions, which will guide you through the process of setting-up the BIOS update on the floppy disk.
3. Reboot the system from the floppy disk and follow the instructions in the README file on the floppy disk.

supporting obdr on systems with embedded RAID controllers

OBDR is not currently supported when the tape drive is attached directly to a RAID controller. If your system includes an embedded RAID controller then you must either disable the RAID on the SCSI interface to which the tape drive will be attached, or use one of the supported plug-in SCSI cards. For example:

- On the Netserver LH3/LH4 you can disable one of the embedded RAID channels so that it behaves like a standard non-RAID SCSI interface.

supporting obdr on hp surestore dat 40x6 autoloaders

Not all OBDR-capable software supports the HP Surestore DAT 40x6 autoloader. Check our WorldWide Web site for up-to-date information.

prompts you will see whilst restoring the system

while restoring Windows NT

When the Windows NT Setup window is displayed you will be prompted to answer a number of questions. Normally, you will be able to accept the default response for each prompt - just press <Enter>.

The standard sequence is:

- Select Express Setup
- Select Overwrite to overwrite existing data on the hard disk. If the hard disk is blank you will be prompted to format it, and select a format type (normally NTFS). The backup software then copies files to the NT file system.
- Select <Enter> at the prompt to reboot.
- Your backup application should start automatically (in restore mode) once the system has rebooted.

Please refer to the documentation supplied with Windows NT and your backup software for a more detailed discussion of these prompts.

while restoring other operating systems

These prompts will vary according to the operating system. Please refer to the documentation supplied with your operating system for exact details.

while restoring data

These prompts occur while your data is restored. They will vary according to the backup application you are using. Please refer to any online Help or documentation that is supplied with your restore software.

if the restoration process fails

The restore process may fail:

- If your backup cartridge is damaged
- If the NT file system has been corrupted

cartridge damaged

Use the last-but-one backup cartridge. You will be able to restore your system and most of your data. You will have to recreate any data that was only written to the damaged backup cartridge.

NT file system corrupted

Very occasionally, you may find that the NT file system has been corrupted. If this happens, you will get error messages when NT Setup tries to copy files to the NT file system. To correct the problem do this:

1. At the first Windows NT Setup prompt, select the Custom Setup option.
2. At the disk partition prompt, select the partition that you were using for the system disk, and:
   i. Click on 'D' to delete it,
   ii. Click on <Enter> and 'L' to confirm deletion.
   iii. Click on <Enter> to install (this automatically recreates the system partition).
3. The remaining prompts are the same as those that occur during the Express Setup.

Please refer to the Windows NT documentation for more detailed information. The process will be similar for other operating systems, but refer to the supplied documentation for a detailed description.

if the backup cartridge is ejected

You must use a cartridge that is OBDR-capable. If you try to insert a backup cartridge that is not OBDR-capable, the tape drive will eject it automatically.

restoring onto Windows NT3.51 systems

HP One-Button Disaster Recovery can fail on NT3.51 systems, if:

- the SYSTEM partition (eg C: drive) is on a SCSI disk,
- **AND** other data partitions are on EIDE disks (eg D: drive).

If your system uses this configuration:

1. Open your PC and disconnect the power lead from the EIDE disk(s).
2. Recover the system disk using OBDR.
3. Shut down and power off your system.
4. Reconnect the power leads to the EIDE disk(s), and then reboot.
5. Partition the EIDE disk(s) as before

You will then be able to restore data to the EIDE disk(s) in the normal way, using the backup software.

restoring onto RAID configurations

In order for Disaster Recovery to work, it must be able to see your system disk. If you want to restore onto a hardware RAID configuration, you must set up the disk RAID before you run Disaster Recovery. This ensures that the Disaster Recovery program can see the system disk.

- Use the Config program on the server configuration CD that is supplied with your system, for example the "NetServer Navigator CD" or the utility partition if available, to configure and run RAID.

restoring onto servers with utility partitions

Disaster Recovery cannot currently recover server-specific utility partitions. If you wish to restore your server utility partition, you must:

- First ensure that there is enough free (unpartitioned) space left on the system disk to rebuild the utility partition after you have restored your system using HP One-Button Disaster Recovery.
- Then use the Config program on the server configuration CD that is supplied with your system, for example the "NetServer Navigator CD", to recreate the utility partition.

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Choose your model by clicking on the picture or the text

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DAT 40i

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features

The HP Surestore DAT 24 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 24 gigabytes on a single DDS-3 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- HP One-Button Disaster Recovery compatible
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption

specifications

physical specification

dimensions	150 mm (6.0 inches) W 41 mm (1.6 inches) H 158 mm (6.2 inches) D
weight	1.0 kg (2.3 lbs)

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 1.2A +12V ± 10% (150 mV maximum ripple) @ 0.1A

performance

interface	Narrow SCSI-2
recording format	DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	24 GB on a DDS-3 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 2 MB/s using DDS-3 with data compression
burst transfer rate	3.0 MB/s (asynchronous) 10.0 MB/s (synchronous)
search speed	40 seconds average file access for any part of a 125-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.30 g peak
shock survival	5 g peak for 3 ms duration

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.41 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- UL Listed to UL 1950 Amd 4
- TUV EN60950 (IEC 950)
- CE Declaration of Conformity
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)

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features

The HP Surestore DAT 24 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 24 gigabytes on a single DDS-3 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- HP One-Button Disaster Recovery compatible
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption

specifications

physical specification

dimensions	116 mm (4.5 inches) W 95 mm (3.7 inches) H 220 mm (8.6 inches) D
weight	DAT 24e: 2.6 kg (5.7 lbs) DAT 24eU: 1.95 kg (4.3 lbs) without power supply

power requirements

power	DAT 24e: 0.5A maximum DAT 24eU: 0.8A maximum 100-240 VAC, automatically detected 50/60 Hz

performance

interface	Narrow SCSI-2
recording format	DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	24 GB on a DDS-3 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 2 MB/s using DDS-3 with data compression
burst transfer rate	3.0 MB/s (asynchronous) 10.0 MB/s (synchronous)
search speed	40 seconds average file access for any part of a 125-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.21 g peak
shock survival	5 g peak for 3 ms duration
noise level	Less than 5.0 Bel sound power

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.10 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- UL Listed to UL 1950 Amd 4
- GS Mark EN60950 (IEC 950)
- NOM 1 NYCE
- FCC Class B Certified
- VCCI Class 2
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)

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features

The HP Surestore DAT 24 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 24 gigabytes on a single DDS-3 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP One-Button Disaster Recovery compatible
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption

specifications

physical specification

dimensions	150 mm (6.0 inches) W 41 mm (1.6 inches) H 158 mm (6.2 inches) D
weight	1.0 kg (2.3 lbs)

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 1.2A +12V ± 10% (150 mV maximum ripple) @ 0.1A

performance

interface	Narrow SCSI-2
recording format	DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	24 GB on a DDS-3 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 2 MB/s using DDS-3 with data compression
burst transfer rate	3.0 MB/s (asynchronous) 10.0 MB/s (synchronous)
search speed	40 seconds average file access for any part of a 125-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.30 g peak
shock survival	5 g peak for 3 ms duration

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.41 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- UL Listed to UL 1950 Amd 4
- TUV EN60950 (IEC 950)
- CE Declaration of Conformity
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)

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features

The HP Surestore DAT 40 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 40 gigabytes on a single DDS-4 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- PRML and Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- HP One-Button Disaster Recovery compatible
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption
- Ultra 2 Wide SCSI interface

specifications

physical specification

dimensions	150 mm (6.0 inches) W 41 mm (1.6 inches) H 158 mm (6.2 inches) D
weight	1.0 kg (2.3 lbs)

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 1.2A +12V ± 10% (150 mV maximum ripple) @ 0.1A

performance

interface	Ultra SCSI-2 (SE and LVDS)
recording format	DDS-4, DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-4 (150 meter), DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	40 GB on a DDS-4 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 6 MB/s using DDS-4 with data compression
burst transfer rate	6.0 MB/s (asynchronous) 40.0 MB/s (synchronous)
search speed	50 seconds average file access for any part of a 150-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.30 g peak
shock survival	5 g peak for 3 ms duration

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.41 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- GOSH Approved
- UL Listed to UL 1950 Amd 4
- TUV EN60950 (IEC 950)
- CE Declaration of Conformity
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)

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features

The HP Surestore DAT 40 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 40 gigabytes on a single DDS-4 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- PRML and Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- HP One-Button Disaster Recovery compatible
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption
- Ultra 2 Wide SCSI interface

specifications

physical specification

dimensions	116 mm (4.5 inches) W 95 mm (3.7 inches) H 220 mm (8.6 inches) D
weight	2.6 kg (5.7 lbs)

power requirements

power	0.5A maximum 100-240V AC, automatically detected, 50-60 Hz

performance

interface	Ultra SCSI-2 (SE and LVDS)
recording format	DDS-4, DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-4 (150 meter), DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	40 GB on a DDS-4 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 6 MB/s using DDS-4 with data compression
burst transfer rate	6.0 MB/s (asynchronous) 40.0 MB/s (synchronous)
search speed	50 seconds average file access for any part of a 150-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.21 g peak
shock survival	5 g peak for 3 ms duration
noise level	Less than 5.0 Bel sound power

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.10 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- GOSH Approved
- UL Listed to UL 1950 Amd 4
- TUV EN60950 (IEC 950)
- GS Mark EN60950 (IEC 950)
- NOM 1 NYCE
- FCC Class B Certified
- VCCI Class 2
- CE Declaration of Conformity
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)
- BCIQ Approved

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features

The HP Surestore DAT 40 combines capacity and performance with reliability and low cost of ownership, making it the ideal choice for network backup. Your new tape drive provides the following key features:

- Reliable DAT technology
- Capacity of 40 gigabytes on a single DDS-4 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- PRML and Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- HP One-Button Disaster Recovery compatible
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption
- Ultra 2 Wide SCSI interface

specifications

physical specification

dimensions	150 mm (6.0 inches) W 41 mm (1.6 inches) H 158 mm (6.2 inches) D
weight	1.0 kg (2.3 lbs)

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 1.2A +12V ± 10% (150 mV maximum ripple) @ 0.1A

performance

interface	Ultra SCSI-2 (SE and LVDS)
recording format	DDS-4, DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-4 (150 meter), DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	40 GB on a DDS-4 cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 6 MB/s using DDS-4 with data compression
burst transfer rate	6.0 MB/s (asynchronous) 40.0 MB/s (synchronous)
search speed	50 seconds average file access for any part of a 150-meter tape

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.30 g peak
shock survival	5 g peak for 3 ms duration

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
vibration	2.41 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- GOSH Approved
- UL Listed to UL 1950 Amd 4
- TUV EN60950 (IEC 950)
- CE Declaration of Conformity
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)
- Class 1 LED product (IEC 825-1)

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features

The HP SureStore DAT 24x6i is the ideal match for today's automated backup applications. Automation reduces the risk of operator errors and saves valuable time. The HP SureStore DAT 24x6i will meet the capacity needs of your growing network. Using hardware data compression, it can store up to 24 GB on a single tape in just over three hours. One magazine stores an entire week's worth of data.

Your new autoloader provides the following key features:

- Random access to to six cartridges in a compact, removable magazine
- Reliable DAT technology
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Capacity of 24 gigabytes on a single DDS-3 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption

specifications

physical specification

dimensions	150 mm (5.9 inches) W 85 mm (3.4 inches) H 210 mm (8.3 inches) D
weight	2.2 kg (4.85 lbs) without magazine

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 0.75A +12V ± 10% (150 mV maximum ripple) @ 2.0A

performance

interface	Narrow SCSI-2
recording format	DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	6x24 GB based on six DDS-3 cartridges with average capacity of 24 GB per cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 2 MB/s using DDS-3 with data compression
burst transfer rate	3.0 MB/s (asynchronous) 10.0 MB/s (synchronous)
search speed	40 seconds average file access for any part of a 125-meter tape
cartridge load/unload time	<14 seconds average
cartridge swap time	15 seconds average

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (79°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.21 g peak
noise level	Less than 5.0 Bel sound power

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15200 m (0 to 50,000 ft)
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- TUV-EN 60950
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features

The HP SureStore DAT 24x6e is the ideal match for today's automated backup applications. Automation reduces the risk of operator errors and saves valuable time. The HP SureStore DAT 24x6e will meet the capacity needs of your growing network. Using hardware data compression, it can store up to 24 GB on a single tape in just over three hours. One magazine stores an entire week's worth of data.

Your new autoloader provides the following key features:

- Random access to to six cartridges in a compact, removable magazine
- Reliable DAT technology
- Read and write compatible with DDS, DDS-2, and DDS-3 formats
- Capacity of 24 gigabytes on a single DDS-3 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
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- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption

specifications

physical specification

dimensions	165 mm (6.5 inches) W 135 mm (5.3 inches) H 269 mm (10.6 inches) D
weight	4.8 kg (10.5 lbs) without magazine

power requirements

power	0.6A maximum 100-240 Vac, 50-60 Hz

performance

interface	Narrow SCSI-2
recording format	DDS-3, DDS-2, DDS-1 (DDS), DDS-DC
media	DDS-3 (125 meter), DDS-2 (120 meter), and DDS (60 and 90 meter) Media Recognition System cartridges
capacity	6x24 GB based on six DDS-3 cartridges with average capacity of 24 GB per cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 2 MB/s using DDS-3 with data compression
burst transfer rate	3.0 MB/s (asynchronous) 10.0 MB/s (synchronous)
search speed:	40 seconds average file access for any part of a 125-meter tape
cartridge load/unload time	<14 seconds average
cartridge swap time	15 seconds average

operating limits

temperature	5°C to 40°C (41°F to 104°F)
humidity	20 to 80 RH (non-condensing)
maximum wet bulb temperature	26°C (78°F)
operating altitude	0 to 4600 m (0 to 15,000 ft)
vibration	0.21 g peak
noise level	Less than 5.0 Bel sound power

non-operating limits

temperature	-40°C to 70°C (-40°F to 158°F)
humidity	5% to 95% RH
non-operating altitude	0 to 15,200 m (0 to 50,000 ft)
vibration	2.10 g rms
shock survival	90 g for 3 ms duration

safety and electromagnetic compatibility

- CSA Certification to C22.2, No. 950 Amd 4
- UL Listed to UL 1950 Amd 4
- GS Mark EN60950 (IEC 950)
- NOM 1 NYCE
- FCC Class B Certified
- VCCI Class 2
- CE Declaration of Conformity CE 73/23/EEC Amended by (93/68/EEC)
- C-TICK Approved (AS/NZS 3548)
- RRL Approved (RRL MIC No. 1996-18)

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features

The HP SureStore DAT 40x6i is the ideal match for today's automated backup applications. Automation reduces the risk of operator errors and saves valuable time. The HP SureStore DAT 40x6i will meet the capacity needs of your growing network. Using hardware data compression, it can store up to 40 GB on a single tape in just over three hours. One magazine stores an entire week's worth of data.

Your new autoloader provides the following key features:

- Random access to to six cartridges in a compact, removable magazine
- Reliable DAT technology
- Compatibility with industry-standard DDS formats, allowing the use of low-cost media
- Capacity of 40 gigabytes on a single DDS-4 tape (assuming a 2:1 data compression ratio)
- Built-in read-after-write verification for a high level of data integrity
- Internal head cleaner that helps prevent head clogging
- Feed Forward Equalizer ensures maximum data integrity
- TapeAlert support for worry-free backup
- HP Library & TapeTools software to verify successful installation and troubleshoot problems
- HP Instant Support for web-based problem identification, diagnosis and resolution providing fast, easy-to-use online solutions to problems
- Hardware data compression increases data storage capacity and data transfer rate
- Low power consumption
- HP One-Button Disaster Recovery
- Localized LCD
- Ultra 2 Wide SCSI interface

specifications

physical specification

dimensions	150 mm (5.9 inches) W 85 mm (3.4 inches) H 210 mm (8.3 inches) D
weight	2.2 kg (4.85 lbs) without magazine

power requirements

power	+5V ± 5% (100 mV maximum ripple) @ 0.75A +12V ± 10% (150 mV maximum ripple) @ 2.0A

performance

interface	Ultra SCSI-2 (SE and LVDS)
recording format	DDS-4, DDS-3 and DDS-2
media	DDS-4 (150 meter), DDS-3 (125 meter), DDS-2 (120 meter) and DDS (90 meter only) Media Recognition System cartridges
capacity	6x40 GB based on six DDS-4 cartridges with average capacity of 40 GB per cartridge (assuming a data compression ratio of 2:1)
sustained transfer rate	Typically 6 MB/s using DDS-4 with data compression
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search speed	50 seconds average file access for any part of a 150-meter tape
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tapealert

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TapeAlert

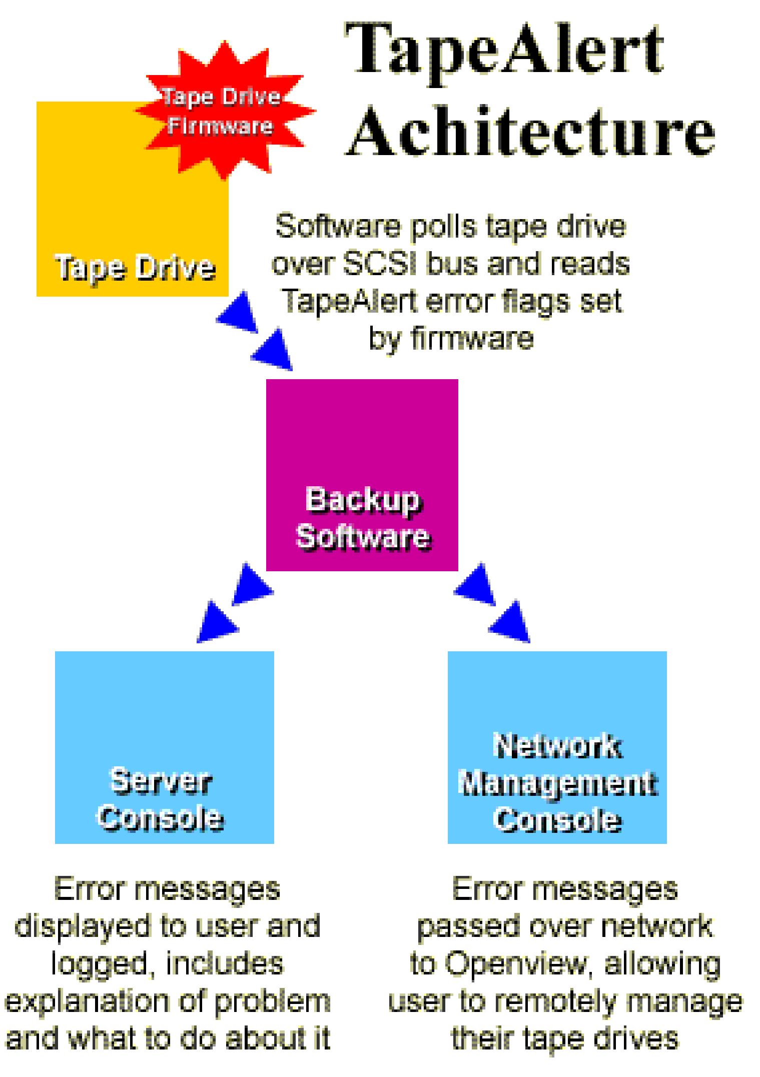
Tape storage systems have a vital role to play in backing up essential data safely and securely. Yet until now, there has been no reliable way to identify errors and potential problems that may compromise their effectiveness or reliability.

Thanks to a new industry standard developed by Hewlett-Packard, however, that situation has changed. TapeAlert is a tape drive status monitoring and messaging utility that makes it easy to detect problems which could have an impact on backup quality. From the use of worn-out tapes to defects in the drive hardware TapeAlert provides easy-to-understand warnings of errors as they arise, and suggests a course of action to remedy the problem.

To take advantage of TapeAlert, you need:

- TapeAlert-compatible tape drives
- TapeAlert-compatible backup software

Network administrators will also find it extremely valuable to have TapeAlert for OpenView, which extends the benefits of TapeAlert across the network.


TapeAlert Achitecture
Tape Drive Firmware
Tape Drive
Software polls tape drive over SCSI bus and reads TapeAlert error flags set by firmware
Backup Software
Server Console
Network Management Console
Error messages displayed to user and logged, includes explanation of problem and what to do about it
Error messages passed over network to Openview, allowing user to remotely manage their tape drives

how it works

TapeAlert compatible tape drives - such as the latest DAT drives from Hewlett-Packard - are delivered with TapeAlert features built in as standard. The internal TapeAlert firmware constantly monitors the drive hardware and the media, checking for errors and potential difficulties. Any problems identified are flagged on a new SCSI log page, where 64 bytes have been reserved for use by TapeAlert.

After a backup has been completed, the TapeAlert-compatible backup application will automatically read the drive's TapeAlert SCSI log page to check for any problems. If an error is flagged, the backup software displays a clear warning message on the user's screen, and adds the TapeAlert messages to its logs. These messages are standard across all applications that support TapeAlert, and are designed to give clear explanation of the problem and suggested resolution. For example, a user attempting to backup onto a worn-out tape would encounter the message:

WARNING: The tape cartridge has reached the end of its useful life:

1. Copy and data you need to another tape

2. Discard the old tape

Errors Monitored

TapeAlert currently checks for errors occurring in the following main categories:

- Drive recoverable read problems
- Drive recoverable write problems
- Drive unrecoverable read problems
- Drive unrecoverable write problems
- Drive hardware defects
- Worn-out media
- Expired cleaning tapes
- Wrong media used
- Abnormal error conditions

TapeAlert for OpenView

TapeAlert for OpenView allows you to bring all TapeAlert-compatible tape drives on the network under the control of the network administrator. It integrates all the features and functions of TapeAlert into HP's network management utility, OpenView for Windows. As a result, tape drives can now be monitored and controlled remotely in the same way as other network elements such as disk drives and printers.

With TapeAlert for OpenView installed, error messages flagged by tape drives are passed to the backup applications in the usual way. The software then forwards the information to the network management console through the server's SNMP interface.

An OpenView alarm is then activated on the management console, alerting the network manager to the tape drives problem. The icon for the relevant server will change colour, with the colour indicating the severity of the alarm as follows:

RED	Critical
YELLOW	Warning
BLUE	Information

TapeAlert for OpenView also provides a graphical view of the tape drives on the selected server. Detailed configuration information is shown, together with a history of previous errors recorded.

For each alarm, TapeAlert provides a brief description of the error, together with the date and time of occurrence and an indication of severity. By clicking on the "More Info" button, it is possible to drill down to details such as the device and media involved, and suggestions for correcting the problem. For consistency and convenience, the error messages are identical to those displayed locally by TapeAlert.

As a result, it is easy for network managers to identify the source of problems occurring on any TapeAlert-enabled drive on the network.

a new standard

TapeAlert has been developed by Hewlett-Packard as a proposed new standard tape drive management. All new tape drives from Hewlett-Packard will be fully compatible with TapeAlert, and many major manufacturers and software companies are expected to adopt the standard. Software companies adopting the standard currently include:

- Computer Associates Software
- Seagate Software
- Stac
- Legato
- Novastor

HEWLETT PACKARD
Certified
TapeAlert
Solution

The TapeAlert standard has been designed to allow easy integration into backup applications from any software vendor. Applications which comply fully with the requirements for TapeAlert will be awarded the use of the TapeAlert logo.

designed for the future

TapeAlert is an advanced technological standard which provides a comprehensive range of state-of-the-art features and functions. However, it has also been designed to allow considerable expansion and development in the future, as new possibilities and opportunities open up.

summary

Reliable, high-quality backups are essential to safeguard the vast amount of data stored on computer systems today. TapeAlert is an innovative standard that enhances reliability by monitoring tape drives and associated media during backup procedures.

Offering clear warnings of problems as they arise, TapeAlert allows users and network managers to eliminate unnecessary errors and ensure that data integrity and security is never compromised. Already gaining substantial support across the industry, TapeAlert is set to become the established standard for tape drive management.

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    - computer boots, but does not recognize drive
  - problems with the drive and cartridge
    - tape drive does not power up
    - LEDs are flashing
    - the application does not recognize the tape drive
    - errors for which you cannot find the cause
  - general use
    - you cannot backup or restore
    - backups are slow
    - poor data compression ratio
    - software compatibility
    - problems writing to tape
    - system crashes when swapping removable drives

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- front panel lights (autoloaders)
- front panel messages (autoloaders)
- hp library & tape tools
- hp instant support
- TapeAlert
- firmware upgrades
- hp obdr troubleshooting

help diagnosing the problem

If you experience problems using your tape drive after installation, use HP Library & Tape Tools or HP Instant Support to help you diagnose the problem. HP Library & Tape Tools is provided free of charge and is invaluable for solving problems with both the SCSI bus and its attached devices. It will help resolve SCSI ID numbers and also run some tests that may help you isolate problems.

HP instant support is a web-based problem identification, diagnosis and resolution service providing fast, easy-to-use online solutions. You can access HP instant support from www.hp.com/go/instantsupport.

You will also find troubleshooting information on the HP Support web site.

The HP Support web site contains links to:

- www.hp.com/support/dat takes you to HP's Customer Care web site for a wide range of up-to-date information about your product
- www.hp.com/cpso-support/guide/psd/cscinfo.html takes you to HP's world-wide call center numbers

general guidelines

If you experience problems when using the tape drive, you need to isolate the cause of the problem. For example, if you have just installed a new SCSI host bus adapter and your system will not start, the cause of the problem is likely to be the adapter.

When installing multiple items of hardware and software, we recommend that you install each in turn and restart the system each time. Similarly if you have already installed multiple devices and software and you experience problems, remove or uninstall each in turn to establish which one is causing the problem.

Remember that the system recognizes devices during boot-up. If you swap or connect a product when your system is running, you will need to reboot the system. Rebooting the system will reset devices and will often resolve problems. It is good practice to reboot every time you add a driver or install firmware.

troubleshooting

The first step in problem-solving is establishing whether the problem lies with the cartridge, the drive, the host computer and its connections, or with the way the system is being operated. If none of the following advice helps you solve the problem, refer to our World Wide Web Customer Care pages www.hp.com/support/dat or call for assistance.

problems with the host computer

Most modern SCSI host bus adapters locate and display attached devices when the system is booting up. If the device is not detected at this stage, there is probably a problem with the physical hardware: cables, termination, connections, power or the HBA itself. Refer to the "SCSI" topic for a detailed discussion of SCSI IDs, termination and cabling.

If your drive is found on system boot up but cannot be found in the operating system, this is more likely to be a software problem.

computer does not boot up

Possible cause	Potential solution
You have connected the tape drive to an existing SCSI bus that has other devices connected to it and the SCSI address of your HP Surestore DAT drive is identical to the address used by another device.	Make sure that each device on the SCSI bus has a unique ID. We recommend that the HP Surestore DAT tape drive is connected to a dedicated host bus adapter. Do not connect the drive to a disk RAID controller as this is not supported.
You have installed an additional SCSI host bus adapter and its resources are clashing with an existing adapter.	Remove the new host bus adapter and check the server documentation
You have disconnected the power or SCSI cable from the computer's boot disk during the drive installation process.	Check that the cables to all devices are firmly connected.

computer boots then hangs

Possible cause	Potential solution
This might be caused by conflicts in your hardware or software configuration, such as two devices with the same SCSI ID or improper termination of the SCSI bus.	Make sure that each device connected to the SCSI controller has a unique SCSI ID. Check that the SCSI bus is actively terminated. (Refer to the documentation for your SCSI controller and any other SCSI devices you may have.)

computer takes a long time to recognize the tape drive

Possible cause	Potential solution
This can occur when the BIOS on a host adapter card is enabled, but there is no bootable SCSI device connected to it.	You may be able to disable the host adapter BIOS to resolve this problem. Check the host adapter manual for instructions on how to disable the BIOS. Do not disable the BIOS for a SCSI controller with a bootable hard disk attached to it. Do not disable the BIOS if you are using HP One-Button Disaster Recovery.

computer boots, but does not recognize the tape drive

Possible cause	Potential solution
The power or SCSI cable is not connected properly.	Check that the cables to the tape drive are firmly connected. Ensure that the SCSI cable is LVDS-compliant and that it does not have any bent pins. Replace, if necessary. (See "Ordering Information".)
The SCSI bus may not be terminated correctly.	1. If your HP Surestore DAT drive is the last or only device on the SCSI bus, make sure the device is properly terminated. 2. If your HP Surestore DAT drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated.
The tape drive's SCSI ID address is not unique.	Identify the SCSI IDs of existing SCSI devices by using HP Library & Tape Tools. Change the drive's SCSI ID. Shut down and turn off the host server or workstation; turn off the desktop drive. Change the drive's SCSI ID. Turn on the host server or workstation and desktop drive.
External drives only: the tape drive may have been switched on after the computer was booted up. The computer checks for SCSI devices only at power-on.	Switch on the tape drive, then switch the computer off and then on again.
The SCSI adapter may be incorrectly configured.	Check the SCSI host adapter configuration. Refer to the SCSI host adapter manuals for instructions.
The SCSI cable may be loose.	Check both ends of the SCSI cable, both for the desktop and internal drives.
The SCSI terminator might be loose or missing.	1. Make sure the terminator is properly seated on the open SCSI connector on the rear panel of the desktop drive or on the last device on the SCSI bus. 2. Make sure an LVD or SE terminator is in place on the end of the SCSI ribbon cable for the internal drive.
The SCSI terminator might not be at the end of the SCSI bus or more than two terminators might be present on the SCSI bus.	Make sure the terminators are placed only at each end of the SCSI bus - one at the host adapter and one on the last device on the bus, both internal and external.
The SCSI host adapter might be in a defective expansion slot.	Move the SCSI host adapter to a different expansion slot.
The SCSI bus might be too long.	Make sure the total length of the SCSI bus does not exceed the ANSI SCSI standard of 3 meters (10 feet) for an SE bus, 12 meters (40 feet) for an LVD SCSI bus with multiple devices, or 25 meters (82 feet) for an LVD SCSI bus with a single device.

problems with the drive and cartridge

tape drive does not power up

Possible cause	Potential solution
The power cable is not connected properly.	Check that the cables to the tape drive are firmly connected. Make sure that the power cable is firmly connected. • For internal devices, try another power connector. • For external devices, you can use the power cable from your monitor or another device to check that the connection is working. If the power supply is present and all LEDs remain off, call for assistance.
The self-test fails.	If there is a cartridge in the drive, remove it. Power down the drive and power it up again. If the self-test still fails, call for assistance.

LEDs are flashing

Possible cause	Potential solution
Tape drives: If the Tape LED is off and the Clean LED is flashing or on constantly, there is a problem with the media or drive.	See front panel lights.
Autoloaders: If the OAR LED is on, operator attention is required. There will also be a message on the LCD.	See front panel lights and front panel messages.

a cartridge is jammed in the drive mechanism

Possible cause	Potential solution
A label may be poorly stuck on the cartridge or in the wrong place, causing it to jam.	Try forcing ejection. See the Forcing Ejection topic for a drive or autoloader. If this fails, call for assistance.

errors for which you cannot find the cause

Possible cause	Potential solution
The AC power source may not be properly grounded. (HP Surestore DAT external drive only.)	1. Plug the HP Surestore DAT external drive's power cable into a power outlet on the same circuit as the host server or workstation. 2. Plug the HP Surestore DAT external drive's power cable into a different power outlet.

general use

you cannot back up or restore

Possible cause	Potential solution
The application does not support the tape drive.	Use HP Library & Tape Tools to check that the drive is installed properly. Refer to our World Wide Web site (www.hp.com/go/connect) for details of backup applications that support the HP Surestore DAT tape drive. Load any service packs as necessary.
The appropriate driver software for the tape drive or autoloader may not be installed.	Check that a driver has been installed that supports both your HP SureStore DAT drive and your backup software. (See your software documentation for details.) If not, install the appropriate driver.
The appropriate ASPI driver for your SCSI controller may not be installed.	When you boot up the computer, check for error messages that refer to SCSI devices or ASPI drivers. Run HP Library & Tape Tools to determine whether the SCSI board is functioning properly. If it is not, make sure that the correct ASPI driver for your SCSI controller is installed.
Your backup software may have encountered a problem.	Refer to the user documentation for your backup software. This should contain a list of error conditions and suggested remedies.
The tape cartridge may be worn out or defective.	Try using a different cartridge. If you have been using the same cartridge for a long time, copy the data on it to a new cartridge and discard the old one.
The operator may not know how to use your backup application, especially if the operator is new or has been away from the job for a while.	Ask the person to repeat the operation while you watch, to check that they are not omitting some vital step.
The cartridge may not be the correct format.	Check that you are using a DDS cartridge, not a Digital Audio Tape (DAT) cartridge. If you are using a different brand of cartridge, it may not be of sufficient quality. See Choosing Cartridges.
The drive may be used in an unsuitable location or outside its operating limits. If it is unusually hot, cold, damp, dry, or dusty, the tape drive may not perform well.	Check the environmental conditions against the drive's specified limits. If they are outside the limits, move the drive to a more suitable site. Clean the tape heads and try the operation again.
A new operating system or upgrade may have been installed without the correct drivers for the tape drive.	Install the correct driver software for the operating system and tape drive.

backups are slow

Possible cause	Potential solution
The backup is being performed over a network.	Backing up across a network is likely to reduce the speed of the backup. Try backing up at a different time of day when there is less network traffic. Where possible, use a dedicated tape drive directly attached to the computer being backed up. Backing up local data (that is data residing on disk drives attached to the same machine as the tape drive, but not necessarily on the same SCSI bus) is almost always faster than backing up over a network. External tape drives can be moved and attached to different servers.
The overall system is not capable of providing data fast enough.	Tape drive performance will be impaired if the server is slow or overloaded. Even if the system is well specified, there can still be bottlenecks that restrict overall performance. Ensure as few processes as possible are running while a backup is being performed. Backup operations and virus scans should NOT be performed at the same time. Information on optimizing performance is given at //www.hp.com/support/dat
Disk drives are on the same SCSI bus as the tape drive.	Disks tend to monopolize the SCSI bus and should be set to a lower SCSI ID such as 0 or 1. Ideally, the tape drive should be on its own SCSI channel or bus (separate from the disks being backed up).
The SCSI adapter is incorrectly set up.	Check your SCSI adapter set-up and ensure you have the latest drivers and software patches installed.
Damaged or worn media.	If the media is damaged, the tape drive may perform many retries before successfully writing or reading data. Try using new media.

poor data compression ratio

Possible cause	Potential solution
Data is already compressed or can only be compressed to a small degree.	Optimum tape drive performance is normally quoted assuming that the data can be compressed by a factor of two (referred to as 2:1 compression). However, some computer data is already compressed and therefore cannot be compressed further. Other data can only be compressed by a small degree depending on type. It is not possible to improve the compression of data.
Compression is disabled.	Some backup software applications allow compression to be turned on and off. Ensure that it is turned on.

software compatibility

Possible cause	Potential solution
It is unclear which software can be used with the HP Surestore DAT tape drive.	The HP Surestore DAT tape drive is widely supported by most common backup applications. Refer to //www.hp.com/go/connect for the latest information on compatability.
Existing software does not work with the HP Surestore DAT tape drive.	Older software may need to be updated. Refer to //www.hp.com/go/connect for the latest information on software downloads.

problems writing to tape

Possible cause	Potential solution
The tape is write protected.	Move the write protect tab out from the write protected position. When in the write protected position, the bright orange area is exposed.
The wrong type of media is being used.	Use only DDS cartridges in the drive. Do not use cartridges labeled "DAT" because the media is not certified and its integrity cannot be guaranteed for data storage purposes. DAT cartridges have a different mechanical specification that can cause them to jam in the mechanism. The tape drive warranty does not cover damage caused by the use of DAT cartridges.

system crashes when swapping removable drives

Possible cause	Potential solution
Exchanging a tape drive installed in a HP Surestore Tape Array 5300 enclosure has disrupted activity on the SCSI bus.	Rack mounted tape drive modules must only be extracted or swapped when the SCSI bus is idle. Even if the device being swapped is not currently in operation, care must be taken that there are not other devices on the bus that are in use.

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frequently asked questions

For further troubleshooting information, refer also to our Customer Support web site:http://www.hp.com/support/dat

How often should I clean the tape drive heads?	It depends on what model tape drive you have and how many backup cartridges you use per day. Refer to Cleaning the Tape Heads for details. You should also clean the heads if the Media Caution signal is displayed. Use only HP cleaning cartridges to clean the heads.
What should I avoid when positioning the tape drive?	Do not place the drive in a dirty environment, for example, on the floor, near a busy walkway, or near a door. Avoid locations subject to sudden temperature changes, such as near an outside door or window. For specific environmental limits, refer to the specifications for your tape drive model.
How many times can I use a DDS cartridge?	The recommended maximum number of passes over any single part of the tape is 2000. In practical terms, this is equivalent to about 100 backup operations.
What types of tape cartridges can I use with my drive?	For optimum performance and storage capacity, use tape cartridges that match your drive's format. The HP Surestore DAT 24 works best with DDS-3 (125m) tapes, but it can also use DDS-2 tapes. The HP Surestore DAT 40 works best with DDS-4 (150m) tapes, but it can also use DDS-3 and DDS-2 tapes. However, using older tape formats can reduce the life expectancy of the device. See Choosing Cartridges for more information.
How do I upgrade the firmware?	You can update the firmware in HP Surestore DAT tape drives either by downloading over the SCSI bus or by loading a firmware update tape. See Firmware Upgrades.
For how long can I archive tapes?	Tests have shown that DDS cartridges will preserve the integrity of stored data for at least thirty years if proper storage conditions are observed. See Storing Cartridges.
How many tapes do I need?	This depends on how much data you back up and how often you back up. See Backup Strategies for more information.
Can I use my cartridges with future HP DDS-format products?	Hewlett-Packard DDS-format products are designed to be backward compatible, so they will be able to read data previously recorded on earlier DDS formats.
Can I do more than one backup to a cartridge?	Yes, if your backup software allows it. Consult the user documentation that came with your backup software for instructions.

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SCSI configuration

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scsi in hp surestore dat devices

The HP Surestore DAT 40 drive and HP Surestore DAT 40x6 autoloader are ultra wide, SCSI-2 compatible devices. They are designed to operate on a low voltage differential (LVD) SCSI interface. They are not compatible with high voltage differential SCSI devices.

The drives support a burst transfer rate of 40 MB/sec. To benefit from this level of performance, it is important to ensure that the drives are connected to a SCSI bus of a similar or higher specification. This means that you need:

- **An Ultra Wide, Ultra2 Wide, Ultra160 or Ultra3 SCSI host bus adapter.** Ultra Wide SCSI supports the maximum bus speed of 40 MB per second, Ultra2, Ultra160 and Ultra3 SCSI exceed this.
- **LVD-rated SCSI cabling and terminators.** The LVD interface enables the data to be transferred at the drive's maximum rate and provides a maximum cable length of 12 meters.

The HP Surestore DAT 24 drive and HP Surestore DAT 24x6 autoloader are single-ended, fast SCSI-2 compatible devices. The drives support a burst transfer rate of 20 MB/sec and should be used with a SCSI bus that meets the Fast specification or higher. They are not compatible with high voltage differential SCSI devices.

All HP Surestore DAT drives can be used with both LVD and single-ended host bus adapters. However, for optimum performance, connect HP Surestore DAT 40 devices to an LVD SCSI bus.

We also recommend that the tape drive or autoloader is connected to a dedicated host bus adapter. If you need to connect multiple devices to the bus, performance will not be restricted as long as devices are of the same type (for example, Ultra Wide SCSI). If one device is single-ended, all devices will be treated as single-ended, which will restrict the maximum permissible length of the cable and could restrict the performance of HP Surestore DAT 40 devices. It could take longer to back up your data.

Make sure that the last device on the SCSI bus is terminated. Do not attach the tape drive to the same SCSI bus as the disk drive. See the section on SCSI termination for more information about terminating HP Surestore DAT tape drives.

what is SCSI?

The Small Computer Systems Interface (SCSI) is popular because it offers a fast and flexible method of connecting a variety of devices to a host computer. The SCSI standards define both the physical connections between the devices (cables and connectors) and the protocols devices use to communicate with each other.

the standards

There have been three general standards:

- **SCSI-1**, which is now obsolete
- **SCSI-2**, which is very common, and still a current standard
- **SCSI-3**, which is an emerging set of linked standards that define much more than the simple bus systems used by the earlier versions. SCSI-3 includes Fibre Channel, Wide SCSI, FireWire (IEE 1398), Low Voltage Differential (LVD or LVDS), and Fast Serial SCSI. Some of these standards are now being used on PC platforms

Another variant is **ATAPI**, which uses an EIDE physical bus to pass SCSI protocols to connected devices. Technically, this is not part of the SCSI-3 standards, although some operating systems (notably Windows NT) manage ATAPI devices as if they were fully SCSI.

SCSI is a backward-compatible standard, so that SCSI-2 and SCSI-3 devices can almost always be made to work together.

SCSI is a ***bus*** interface: all the devices are connected to a single cable (some of this may be inside and some outside the host computer's case). The connection to the host itself is known as the Host Bus Adapter (HBA). You can have several HBAs in a single computer, each with its own SCSI bus: this is a common arrangement in high-performance servers. Some host bus adapters (such as the Adaptec 3940W) have more than one SCSI bus available on a single card.

Various terms are used when describing SCSI devices. These terms relate to the factors that affect performance and cable length:

- The speed of the data bus, which may be Fast, Ultra, Ultra2, Ultra3, Ultra160 or Ultra320.
- The width of the data bus, which may be Narrow or Wide.
- The voltage level of the interface, which may be single-ended (SE) or low voltage differential (LVD).

As described above, HP Surestore DAT 40 drives and DAT 40x6 autoloaders are Ultra Wide SCSI devices designed to operate on a low voltage differential SCSI interface. HP Surestore DAT 24 drives and DAT 24x6 autoloaders are Fast SCSI devices designed to operate on a Fast SCSI interface.

setting up the SCSI bus

Each device on a SCSI bus, including the SCSI host bus adapter (HBA), must be configured with a unique ID (identifier). The SCSI bus must be terminated.

Note: HP recommends that a dedicated host bus adapter is used for the tape drive. A suitable adapter is available from HP as an accessory (see Ordering Information).

SCSI ID numbers

For wide SCSI buses, the SCSI ID will be a number from 0 through 15, so a typical wide SCSI HBA can accommodate up to fifteen other devices.

SCSI IDs are usually set on the device itself (sometimes via configuration software), but some newer devices are capable of selecting an unused ID automatically when powered-up (these are known as "SCAM" devices). HP Surestore drives are SCAM-1 compliant. This means that the drive will return its SCSI ID to the host bus adapter in response to a SCSI inquiry, but it will not allow the adapter to change the SCSI ID.

SCSI ID 7 is normally reserved for the HBA because it has the highest priority on the bus. On wide buses, the priority runs from 7 (highest) to 0, then 15 down to 8 (lowest).

Narrow: 7 6 5 4 3 2 1 0
High —— priority —— Low
Wide: 7 6 5 4 3 2 1 0 15 14 13 12 11 10 9 8

Note: As a general rule, avoid putting tape devices on the same bus as any hard disks.

identifying SCSI IDs

If your computer already has devices connected to the SCSI bus, you will need to know their IDs to avoid any conflict with the new tape drive. Here are some methods of finding out the information:

- The fastest and easiest way is to run HP Library & Tape Tools from this CD-ROM. HP Library & Tape Tools will check your SCSI configuration, including the SCSI controller itself and any devices currently attached to it.
- Most computers display a list of SCSI devices and IDs during the boot-up process. This usually scrolls past very fast. If you press the [Pause] key, you should be able to halt the scrolling and view the list.
- If you have an Adaptec host adapter in the computer, it may have come with a Windows utility called SCSI Interrogator (SHOWSCSI.EXE) which displays information about connected devices.
- If you have Windows NT installed, select SCSI Adapters from the Control Panel, select a device in the Devices tab and click on Properties to view information about the device, including its SCSI ID.
- If you have Novell NetWare installed, use its LIST DEVICES command.

If none of these is available to you, try the following sources of information:

- The details of all installed devices and settings may have been written down and stored with your computer's documentation (for new computers, this is often done by the supplier).
- Your HBA's documentation should tell you which settings it uses.
- Look at each device to find out its ID. This is usually easy with external devices. With internal devices, you will probably need the help of the device's documentation to identify the SCSI ID setting, which is usually set with jumpers.

setting the scsi id on hp surestore dat drives

For all cases, see the *Getting Started Guide* that came with your tape drive for more details. Note that host adapters check SCSI IDs only at power-on, so any changes will not take effect until the host system is power-cycled.

- On internal HP Surestore drives, set the SCSI ID by attaching or removing jumpers at the rear of the drive.
- On external HP Surestore drives, the ID is displayed on the rear panel and can be set by pressing the little buttons above and below the number.
- On removable HP Surestore drives, the ID is set on the back of the tape array.

SCSI termination

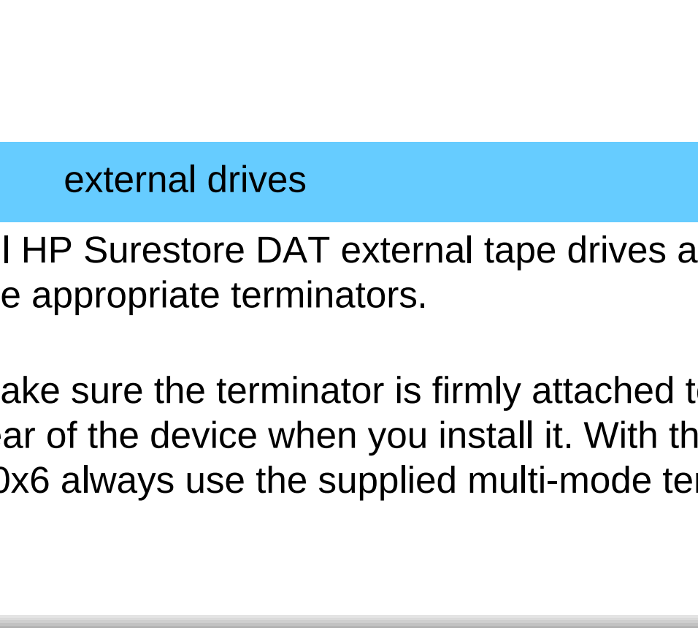
Terminators are essential, as they provide the correct voltages on the SCSI bus and prevent unwanted signal reflections from interfering with data transfers. The rule is:

There must be termination at both physical ends of the bus and only at the ends.

There are two main types of termination, active and passive. Active terminators reduce interference and allow faster data throughput. On devices with high transfer speeds, such as HP Surestore DAT 40 and DAT 24 devices, active termination is required. Multi-mode active terminators are used with ultra wide LVD SCSI buses. These terminators detect the type of bus and automatically supply the correct termination

Normally the HBA forms one end of the SCSI bus and provides termination. You, therefore, need to ensure that the other end of the bus is terminated.

internal drives



Usually the internal SCSI cable in a server has a number of SCSI connectors along its length and a terminator at the end farthest from the host bus adapter. This will usually be a small, rectangular block of plastic attached to the cable end and marked ‘SCSI Terminator’.

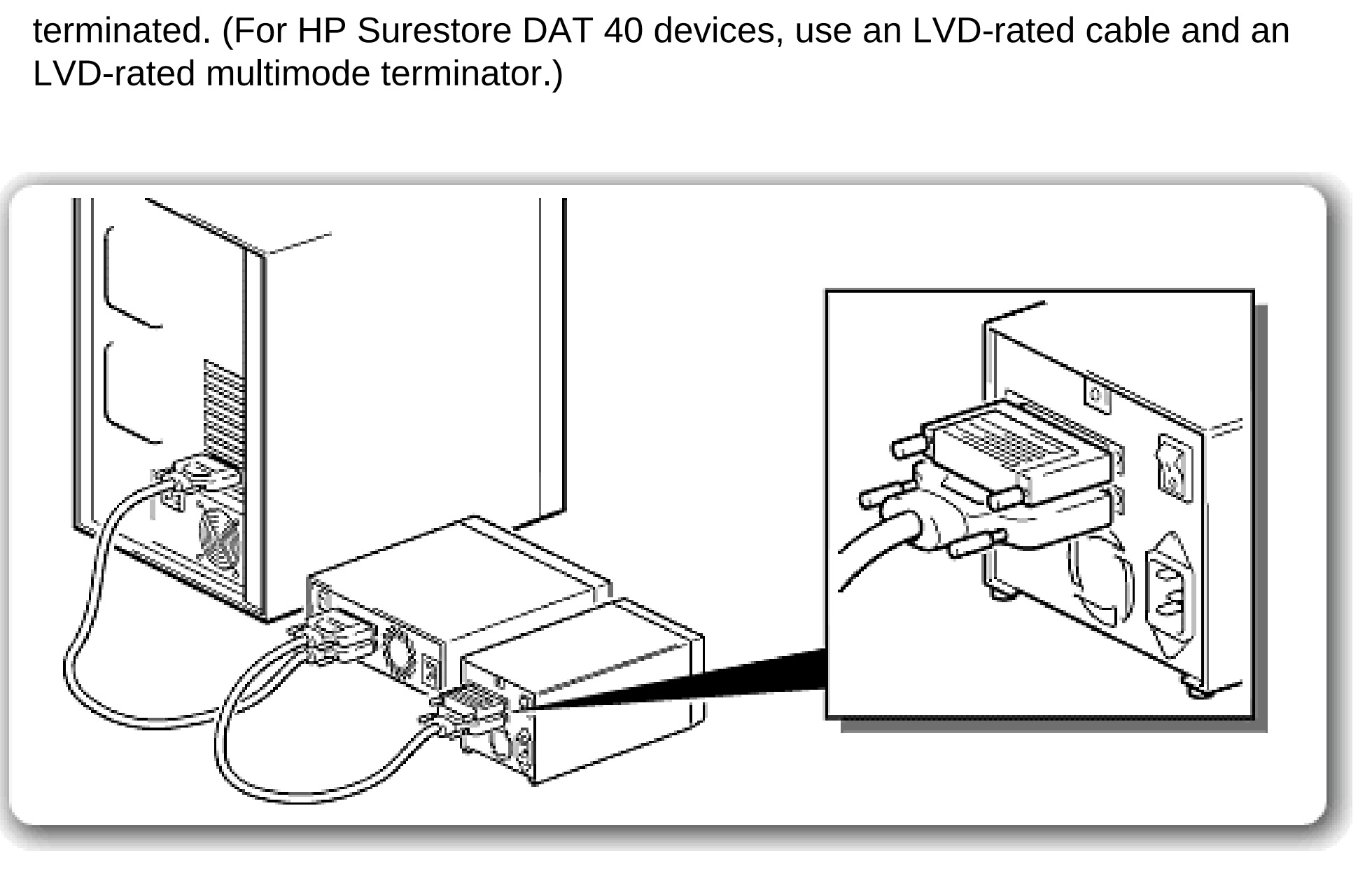
As long as this terminator is attached, you do not need to take any further action. However, if you have other devices attached to the cable, make sure that they have termination removed or disabled.

Note: If you have an internal and external device attached to the same SCSI bus, the HBA will be in the middle of the cable and thus its termination must be disabled. See the host bus adapter's documentation for details of how to do this.

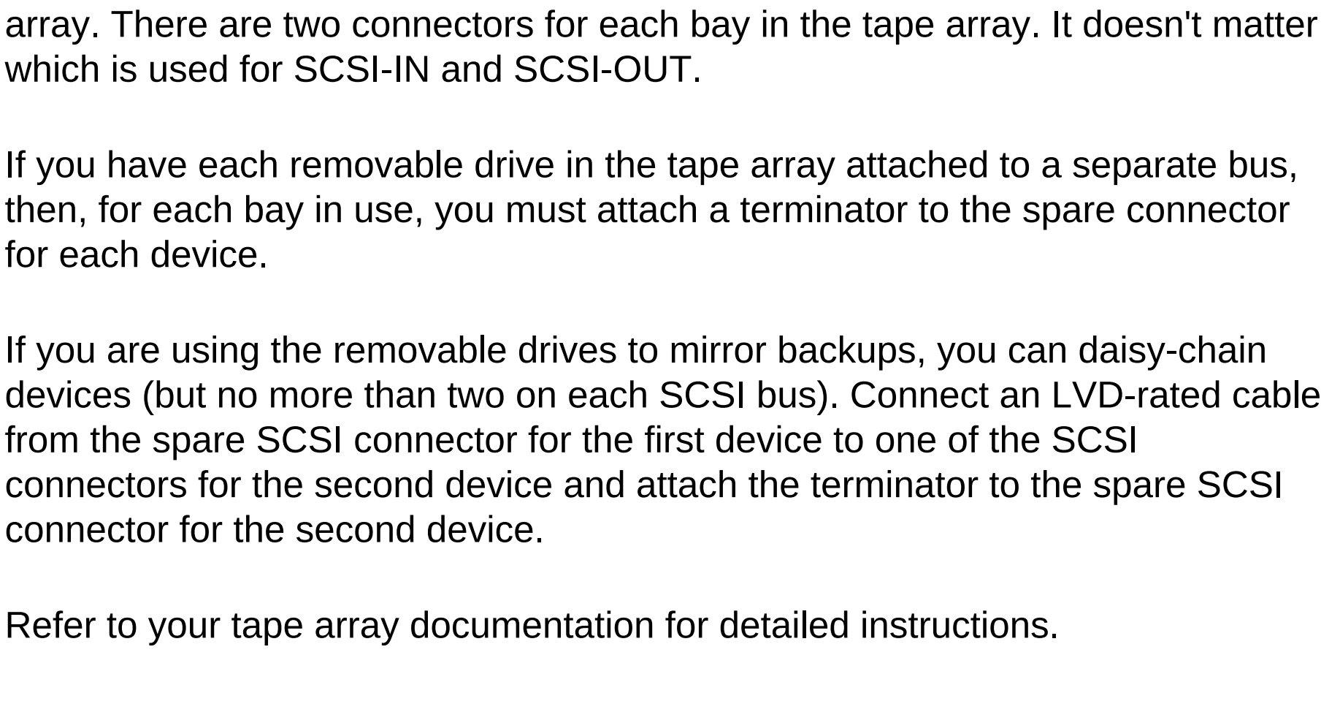
external drives

All HP Surestore DAT external tape drives and autoloaders are supplied with the appropriate terminators.

Make sure the terminator is firmly attached to the SCSI-OUT connector on the rear of the device when you install it. With the HP Surestore DAT 40 and DAT 40x6 always use the supplied multi-mode terminator for proper operation.



If you have more than one device on the SCSI bus, daisy-chain them by connecting a cable from the SCSI-OUT connector on the first device to the SCSI-IN connector on the second device and make sure that the second device is terminated. (For HP Surestore DAT 40 devices, use an LVD-rated cable and an LVD-rated multimode terminator.)



removable drives

For HP Surestore DAT removable tape drives, termination is provided by connecting a terminator to the spare SCSI connector on the rear of the tape array. There are two connectors for each bay in the tape array. It doesn't matter which is used for SCSI-IN and SCSI-OUT.

If you have each removable drive in the tape array attached to a separate bus, then, for each bay in use, you must attach a terminator to the spare connector for each device.

If you are using the removable drives to mirror backups, you can daisy-chain devices (but no more than two on each SCSI bus). Connect an LVD-rated cable from the spare SCSI connector for the first device to one of the SCSI connectors for the second device and attach the terminator to the spare SCSI connector for the second device.

Refer to your tape array documentation for detailed instructions.

SCSI cables

Cables matter in SCSI systems. There are two factors to consider: cable length and cable quality.

cable length

- For single-ended SCSI with Fast devices there is a maximum permissible length of 6 meters for a single SCSI bus.
- For single-ended SCSI with Ultra devices the maximum permissible length is 3 meters for four or fewer devices, and 1.5 meters for more than four devices.
- For LVD SCSI the maximum length for a single device is 25 meters. For multiple devices, the maximum combined internal/external length is 12 meters.
- If you have a combination of LVD and SE devices on the bus, the maximum cable length reverts to the SE specification. See note on SE and LVD interfaces for more information.
- For best performance, keep lengths to a minimum, but avoid very short overall lengths (less than 0.5 meters).

cable quality

- It is important to use good quality cables. Generally speaking, cable quality affects performance and reliability. This is particularly true for external, shielded cables.
- Look after your SCSI cables. In particular, take care when connecting or disconnecting not to damage the high-density connectors. Avoid putting excessive twists in external shielded cables, as this can cause premature failure.

with internal devices

For HP Surestore DAT internal devices, you need a SCSI ribbon cable with the correct termination. HP Surestore DAT 40 and DAT 40x6 drives have a 68-pin wide, high-density SCSI connector. If you are using an HP Surestore DAT drive on an internal bus with other peripherals that run at Ultra or Ultra2 speeds, it is important that a 68-pin LVD-compatible ribbon cable is used. If your computer uses narrow SCSI, you will need a cable or adapter that enables you to connect a wide SCSI device (68 pins) into the narrow SCSI bus (50 pins). This can be purchased from your supplier.

HP Surestore DAT 24 and DAT 24x6 devices have a 50-pin narrow SCSI connector. If your computer uses wide SCSI, you will need a cable or adapter that enables you to connect a narrow SCSI device (50 pins) into the wide SCSI bus (68 pins). This is provided with your tape drive.

with external devices

The cable provided with all HP Surestore DAT external tape drives and autoloaders will attach to a computer with a wide LVDS SCSI connector (68 pins).

with VHD connector

If your server or host bus adapter is equipped with a very high density (VHD) wide SCSI connector, you will need to order a 68-pin HD-to-VHD converter or 68-pin HD-to-VHD cable. See Ordering Information.

with removable devices

For HP Surestore DAT removable tape drives, appropriate cables are provided with the tape array.

note on SE and LVD interfaces

SE and LVD define how the signals are transmitted along the cable.

- With **single-ended (SE) SCSI**, each signal travels over a single wire and each signal's value is determined by comparing the signal to a paired ground wire. Signal quality tends to decrease over longer cable lengths or at increased signal speed.
- With **low voltage differential (LVD) signaling**, signals travel along two wires and the difference in voltage between the wire pairs determines the signal value. This enables faster data rates and longer cabling with less susceptibility to noise than SE signaling and reduced power consumption.

If you use LVD SCSI devices on the same bus bus as single-ended devices this will switch the LVD SCSI host adapter into single-ended mode and restrict cable length.

If you connect only LVD SCSI devices, the bus will operate in low voltage differential mode and Ultra2 speeds will be enabled. You can use a combination of Ultra and Ultra2 devices. Each device will operate at its optimum speed.

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ordering supplies

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SCSI cables

identifying SCSI connections

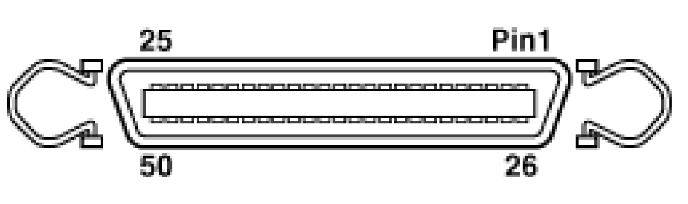
HP Surestore DAT 24 tape drives and autoloaders are single-ended, fast SCSI-2 compatible devices. External drives have a 50-pin, low density bail SCSI connector.

The HP Surestore DAT 40 drive and HP Surestore DAT 40x6 autoloader are ultra wide, SCSI-2 compatible devices. External drives have a 68-pin, high density screwlock (or thumbscrew) SCSI connector.

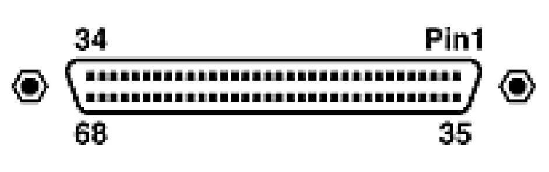
To determine the appropriate SCSI cable, you need to know what type of SCSI port the host server has. Is it 8-bit (narrow) or 16-bit (wide), is it single-ended (SE) SCSI or low voltage differential (LVD) SCSI, is it low density (LD), high density (HD) or very high density (VHDCI)?

The following diagrams may help you identify the different types of SCSI connector.

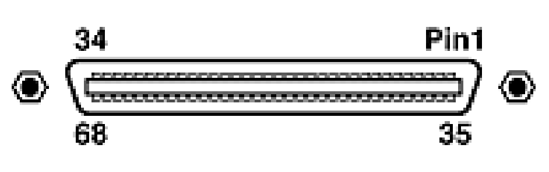
50-contact, centronics-type, ribbon contact connector as used for Slow, Fast or Ultra, 8-bit Narrow SCSI applications, such as HP Surestore DAT 24 devices.



68-pin high-density SCSI connector as used for 16-bit Wide or Ultra Wide SCSI devices, such as HP Surestore DAT 40 devices.



68-contact, ribbon type connector, known as the "VHDCI" SCSI connector. (You need an adapter if you want to use HP Surestore DAT devices with a VHDCI connector.)



internal drives and autoloaders

No additional cables are supplied with HP Surestore DAT internal tape drive and autoloaders. However, the following cables may be ordered:

hp surestore DAT 40 and DAT 40x6

Item	Description	Part Number
1.0 m internal	4 connector, 68-way, terminated, LVD/SE Ultra2 quality conductor	C7424A

hp surestore DAT 24 and DAT 24x6

Item	Description	Part Number
1.0 m internal	SCSI cable, 4 connector, 50-way, terminated	C5644-61000

external drives and autoloaders

hp surestore DAT 40 and DAT 40x6

Should you require an additional cable of the same or different length for connection to the same type of SCSI host, order one of the following:

Item	Description	Part Number
0.9 m external	68-pin high density to 68-pin high density, LVD/SE Ultra2 quality conductor	C5741A
1.5 m external	68-pin high density to 68-pin high density, LVD/SE Ultra2 quality conductor	C5742A
2.5 m external	68-pin high density to 68-pin high density, LVD/SE Ultra2 quality conductor	C5743A

Should you require an additional cable for connection to a narrow (50 pin) low density SCSI host, order the following:

Item	Description	Part Number
0.9 m external	SCSI cable, 68-pin high density to 50-pin high density latch	C5679A

hp surestore DAT 24 and DAT 24x6

The following cables may be ordered:

Item	Description	Part Number
1.0 m external	SCSI cable, 50-pin HDLC to 50-pin LDBL	K2286
1.0 m external	SCSI cable, 50-pin LDBL to 50-pin LDBL M/M	92222B
1.0 m external	SCSI cable, 50-pin HDTS to 50-pin LDBL M/M	K2296

removable drives

No cables are supplied with the HP Surestore DAT removable tape drive. However, you may need additional cables to connect from the HP Surestore Tape Array 5300 to the host server, or to daisy chain the connections for two removable drives on the rear of the tape array. The following cables may be ordered. Select the appropriate one according to the SCSI specification of the host server:

Item	Description	Part Number
0.5 m	high density, screw lock, 68-pin, multi mode, LVD	C2978B
1.5 m	high density, screw lock, 68-pin, multi mode, LVD	C2979B
0.9 m	high density, screw lock, 68-pin, multi mode, LVD/FWD	C2911C
2.5 m	high density, screw lock, 68-pin, multi mode, LVD/FWD	C2924C
5.0 m	high density, screw lock, 68-pin, multi mode	C7521A
10.0 m	high density, screw lock, 68-pin, multi mode	C7522A
1.0 m	very high density, screw lock, 68-pin/high density, screw lock, 68-pin, LVD	C2361B
2.5 m	very high density, screw lock, 68-pin/high density, screw lock, 68-pin, LVD	C2362B
5.0 m	very high density, screw lock, 68-pin/high density, screw lock, 68-pin, LVD	C2365B
10.0 m	very high density, screw lock, 68-pin/high density, screw lock, 68-pin, LVD	C2363B

terminators

external drives and autoloaders

Should you require an additional terminator, order one of the following according to the drive/autoloader model:

Model	Description	Part Number
DAT 40 and 40x6 devices	multimode (external, LVD, active)	C5738A
DAT 24 and 24x6 devices	SCSI terminator (external single-ended, low-density, active)	K2291

removable drives

No terminators are supplied with the HP Surestore DAT removable tape drive. However, you may need additional terminators to terminate the connection from the HP Surestore Tape Array 5300 to the host server. The following terminators may be ordered. Select the appropriate one according to the drive/autoloader model:

Model	Description	Part Number
DAT 24 and 24x6 devices	SCSI terminator (single-ended, active)	C2972A
DAT 40 and 40x6 devices	SCSI terminator (LVD, active)	C2364A

adapters

host bus adapters

If you need to purchase a SCSI host bus adapter (HBA), refer to http://www.hp.com/go/connect for the recommended HBA for your system. The following orderable accessories are recommended for most systems:

Model	Description	Part Number
DAT 24 and 24x6 devices	SCSI ultra wide connect kit	C7558B
DAT 40 and 40x6 devices	SCSI ultra 160 connect kit	C7474A

SCSI cable adapters

If your system requires an additional SCSI cable adapter, order the following:

Model	Description	Part Number
DAT 24 and 24x6 internal devices	50-pin female to 68-pin female ribbon cable adapter (for internal devices)	C5710A
DAT 40 and 40x6 internal devices	68-pin male to 50-pin male ribbon cable adapter (for internal devices)	C7423A
All external drives and autoloaders	68-pin HD to 68-pin VHDCI SCSI adapter (for external devices)	C7434A

rail kits

The correct tray or rail kit is supplied with the drive or autoloader:

- For mounting an internal drive inside an HP L-series, HP E-series, Kayak, Brio, Vectra or Compaq server.
- For mounting an internal autoloader inside an HP L-series or Compaq server.

Should you require rail kits for mounting your drive in certain Dell servers, order the following:

Item	Description	Part Number
Dell rail kit	for Dell PowerEdge servers 2300, 4100, 4200	C5732A

Most other servers have all the required mounting hardware. If this is not the case with your server, contact your system vendor.

media

The following media is recommended for use with HP Surestore DAT tape drives and autoloaders:

Item	Description	Part Number
data cartridge	HP DDS-3, 24 GB*	C5708A
data cartridge	HP DDS-4, 40 GB*	C5718A
autoloader magazine	DDS autoloader magazine (empty)	C1571A
magazine preloaded for DAT 24x6	DDS autoloader magazine preloaded with 5 HP DDS-3 24 GB* cartridges and 1 HP DDS cleaning cartridge	C1570A
magazine preloaded for DAT 40x6	DDS autoloader magazine preloaded with 5 HP DDS-4 40 GB* cartridges and 1 HP DDS cleaning cartridge	C7436A
cleaning cartridge	HP DDS cleaning cartridge	C5709A
storage box	DDS cartridge storage box (holds 12 cartridges)	92283L
** assumes 2:1 compression*		

dat tape drive user's guide

data protection

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loading and unloading autoloaders

contents of this section

- loading a magazine and cartridges
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- forcing ejection

related topics

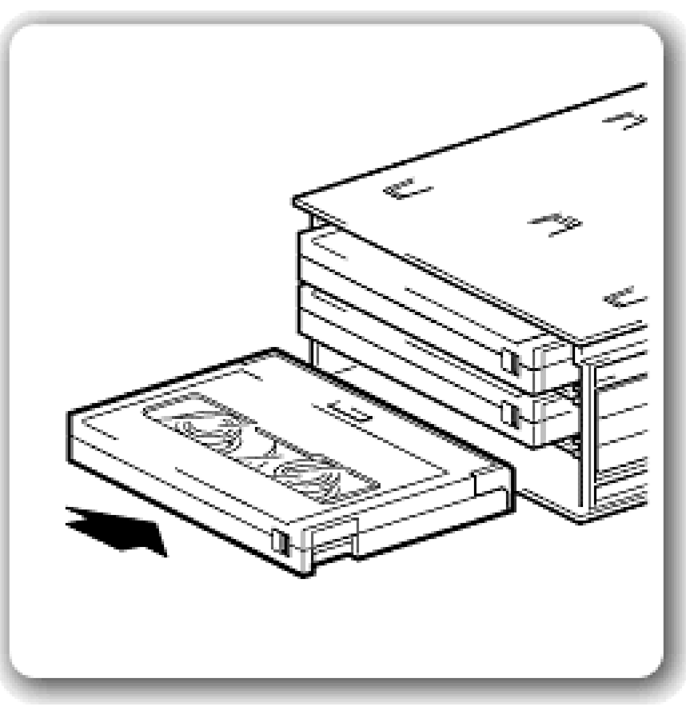
- interpreting the front panel lights
- cartridges
- localizing language display (DAT 40x6 only)
- autoloader modes of operation

loading a magazine and cartridges

The autoloader is configured to use DDS cartridges. Any other cartridge will be treated as write-protected; you will only be able to read it, not write to it. See Choosing Cartridges for advice on which cartridges to use with your autoloader.

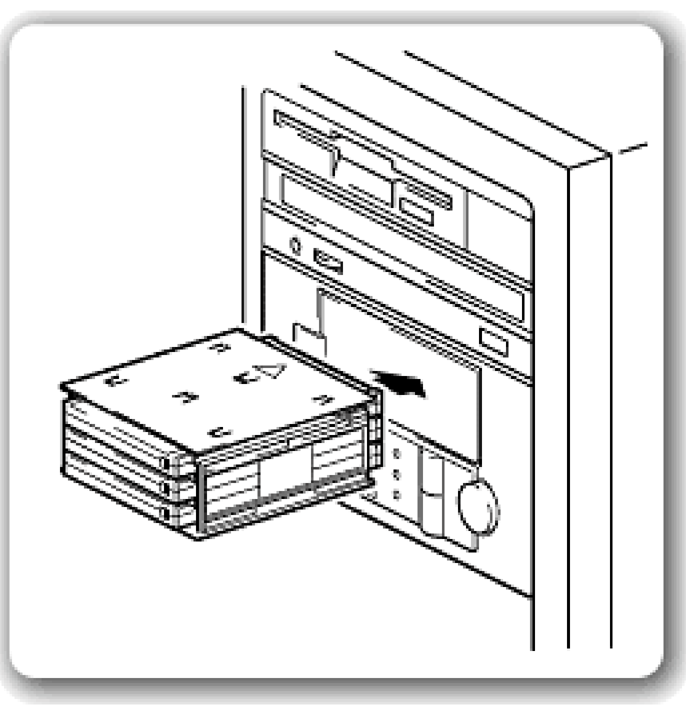
In order to maximize drive and media reliability, we recommend that you normally use the autoloader to provide one week's backup per magazine. Ideally, use five cartridges and one cleaning cartridge in each magazine (DDS-3 cartridges with HP SureStore DAT 24x6 autoloaders and DDS-4 cartridges with HP SureStore DAT 40x6 autoloaders). This allows you to perform a full backup, up to 40 GBytes for DAT 40x6 models and 24 GBytes for DAT 24x6 models, each working day, and ensures that the tape heads are cleaned once a week.

Note: For best performance and error-free operation, it is advisable to use only one brand and type (tape length) of data cartridge in a magazine. Ideally, use only HP's DDS-4 or DDS-3 cartridges. **Do not** mix DDS-1 (90m) with DDS-2 (120m), DDS-3 (125m) or DDS-4 (150 meter) cartridges. It is perfectly acceptable to include a cleaning cartridge in a magazine.

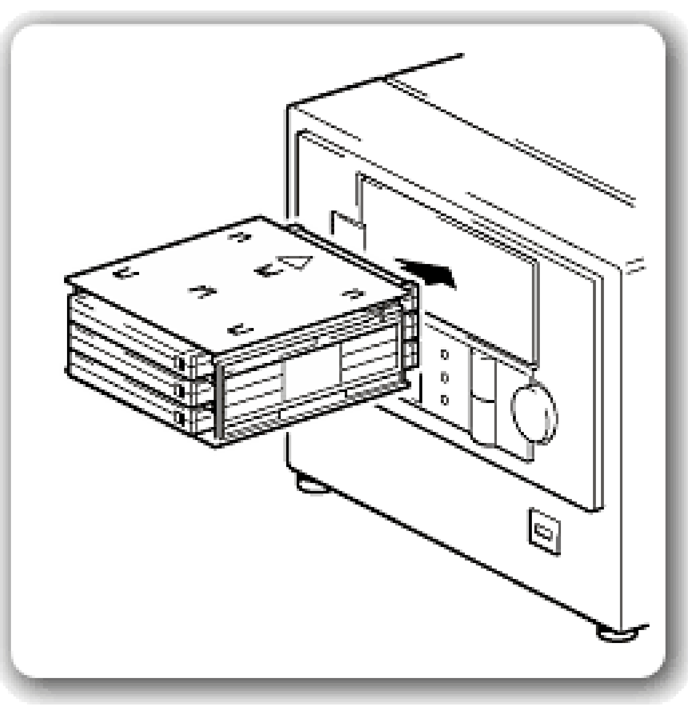


Place the required number of cartridges in the magazine so that they point towards the center of the magazine. You can use any number of cartridges from 1 to 6, and can place the cartridges in any of the magazine slots. However,for ease and speed of use, start by using slot 1. During a stacker mode backup, the drive will attempt to load the first cartridge from slot 1.

1. Insert the magazine through the door in the front of the autoloader. Make sure that the large arrow is uppermost and pointing towards the autoloader, as shown below.
2. Apply steady pressure until the mechanism takes the magazine and pulls it into the autoloader. The autoloader will then check which magazine slots contain cartridges.
3. When the magazine check is complete, use either your backup software on the host computer or the autoloader's front panel buttons to select and load a cartridge from the magazine into the drive.



internal autoloaders



external autoloaders

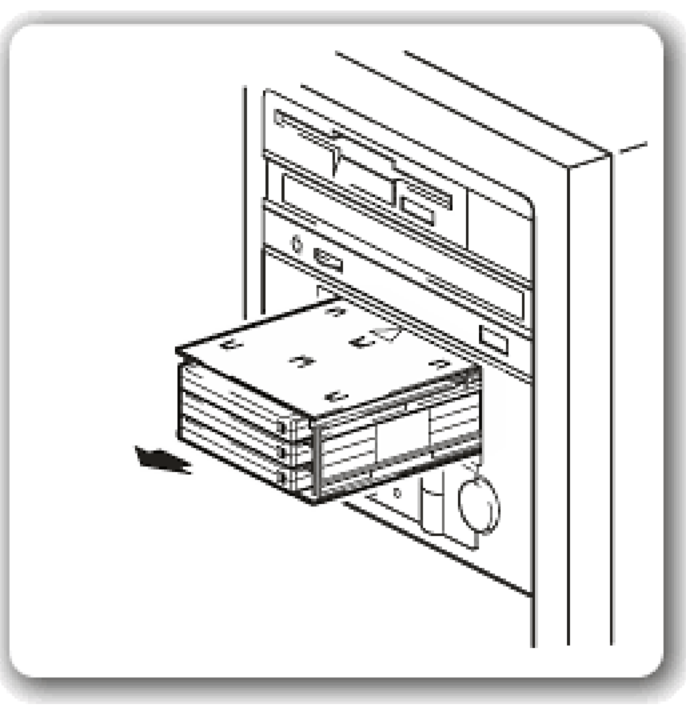
The drive now performs a load sequence. This takes a maximum of 25 seconds from the time the cartridge is inserted to the time the drive is ready to start acting upon the next command from the host. The sequence is as follows:

- The drive mechanism threads the tape and checks the tape format (DDS or audio). If the tape is blank, the drive leaves the tape at BOT (Beginning of Tape) and awaits the next command.
- If the tape is in DDS format and is write-enabled, the drive performs write and read tests. If the error rate is high, the Operator Attention Required light illuminates and an error message may appear on the front panel display.
- The drive reads the tape log, which contains details of the history of the tape.
- The drive rewinds to BOP (Beginning of Partition) and goes online, awaiting a command from the host.

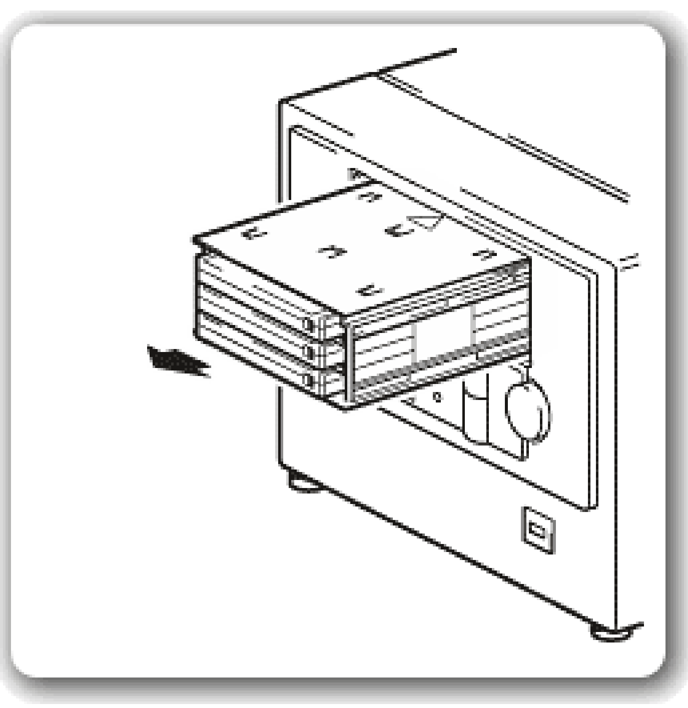
Depending on whether the host computer instructed the autoloader to load a cartridge or you pressed the Load Cartridge button, the autoloader goes into one of two modes of operation: random mode, where movement of cartridges is controlled by the backup software, or stacker mode, where cartridges are loaded in numerical order from the magazine. For more information, see Autoloader Modes of Operation.

ejecting the magazine

1. To eject a magazine, press the Eject button.
2. The autoloader ejects the magazine.



internal autoloaders



external autoloaders

If one of the cartridges is still in the drive mechanism when you press the Eject button, the autoloader performs the following sequence of actions first:

- The drive rewinds the tape and updates the tape log (unless the cartridge is write-protected). It then ejects the cartridge from the drive mechanism.
- The changer mechanism replaces the cartridge in the magazine.
- The magazine is ejected.

Note: It is possible for the host computer to disable the Eject button by sending a `PREVENT MEDIA REMOVAL` command via SCSI. This will remain in force until either the host sends an `ALLOW MEDIA REMOVAL` command or the autoloader is reset or power-cycled.

forcing ejection

If you press the Eject button when the autoloader is busy, it may be a long time before the autoloader will respond to the request because it will finish the task it is performing first. This ensures that the task is terminated in a controlled manner and no data is lost.

However, if you need to unload a cartridge urgently, even at the risk of losing data, you must force ejection.

Caution: You can lose data if you force ejection. The tape may also end up invalidly formatted because an EOD (End of Data) mark might not be written. Force ejection only as a last resort to recover a cartridge.

To force ejection:
Hold the Eject button down for at least five seconds (usually between 5 and 10 seconds). The autoloader responds as follows:

- The front panel display will show "Force Eject."
- The autoloader waits 35 seconds to give the normal eject procedure a chance to occur.
- Once this time has elapsed, if there is a cartridge loaded in the drive it is immediately unloaded, regardless of what operation the drive was performing. The cartridge is then returned to its slot in the magazine, and the drive is reset as though the power had been cycled.
  Because the forced ejection may interrupt any operation, it is possible that the drive will not write an EOD (End of Data) mark before the cartridge is ejected. This will cause loss of data and leave the cartridge with an invalid format.
- If no cartridge is loaded in the drive, the autoloader assumes that you want to eject the magazine. Following the 35-second pause, it does this. The autoloader is then reset as though power had been cycled.

Note: A forced ejection will abort any SCSI operations that may be in progress on the autoloader and overrides any `SCSI PREVENT MEDIA REMOVAL` in effect.

how to contact hp

obtaining technical support

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- before calling for service or support
- obtaining service
- contacting hp
- hp service agreements
- returning your tape drive for service
- worldwide online services

before calling for service or support

If you need help, your dealer has the latest information regarding HP products and services and can provide support under HP's comprehensive menu of reseller services. If your dealer is not able to help, you can obtain support from HP directly either through online services or by telephone.

Before calling for service or support:

- Check that your HP Surestore Tape Drive is installed correctly
- Check the printed Getting Started Guide and the troubleshooting advice in this online User's Guide
- Check HP Instant Support - this is a web-based problem identification, diagnosis and resolution service providing fast, easy-to-use online solutions. You can access HP Instant Support from www.hp.com/go/instantsupport

When calling HP Customer Support, please be prepared to work with the HP support specialists to resolve your problem. This may involve downloading software from the web and performing appropriate diagnostic on your drive if appropriate, aided by the service agent.

obtaining service

Please use the Customer Service Form to collect the details that our Customer Service Representative will need to help solve your problem.

During the warranty period: HP provides a free telephone support service during the warranty period. Contact your local HP dealer or the appropriate HP technical support contact for your area, by selecting the region required from the navigational buttons in the left hand pane. Obtain the telephone number from the list of countries supplied. You will be connected to a responsive team waiting to help you.

After the warranty period: If you require support after your warranty has expired, you can receive support for a fee through the same telephone numbers. The fee is charged on a per incident basis. Alternatively, you can contact your local HP dealer who will be able to advise you and arrange for service.

contacting hp

A full listing of HP's service and support centres worldwide can be found at http://www.hp.com/cposupport/mail_support.html

If you do not have internet access, click on the appropriate region from the side navigation bars for a list of contact numbers correct at time of printing.

hp service agreements

HP offers a number of service agreements to meet your needs. Contact your local dealer or nearest HP office for further information.

returning your tape drive for service

Your HP Surestore tape drive comes with a 24-hour Express Exchange warranty (not available in all countries).

Before returning an HP Surestore tape drive, call the Customer Support Center for your area. When you call, make sure that you have the following information available:

- The product name and serial number (see label on the back of the appliance server)
- Date of purchase
- A description of the product fault
- A contact name for details of the failure
- A contact telephone number
- Your shipping address

The telephone service agent will verify that the unit is faulty and will make sure that a replacement unit is sent to you within 24 hours. When you receive the replacement unit, remove it from the packaging and use the packaging material for returning the faulty unit. All shipment costs are prepaid by HP.

When returning the drive to HP, any damage caused as a result of inadequate packaging is your responsibility. Use the original packing materials whenever possible.

worldwide online services

HP offers electronic services that give you a fast, interactive way to access information and help on setup, configuration, installation and operation of your product. The online services are available on the World Wide Web and FTP, as well as the country-specific resources listed later in this section.

World Wide Web

Product and support information are available from HP's web site on the Internet at `http://www.hp.com/go/tape`

FTP

Product and support information are available from our FTP site on the Internet at `ftp.hp.com/pub/information_storage/surestore`

America Online

Download support documents and discuss issues in user forums. Find us with keyword `hpstor`.

how to contact hp

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check the web for up to date information

If you have internet access, click on the URL below:

http://www.hp.com/cposupport/mail_support.html

From time to time, telephone numbers and addresses may change; accessing contact details over the web will ensure you have the latest information.

If you do not have internet access, refer below for a list of contact numbers correct at time of printing:

hp support in north america

Customers in North America can contact HP on the telephone support lines listed, by country, below.

canada

Telephone	905-206-4663	905-206-4663
	Hours of operation: 8.00 a.m. to 8:00 p.m. Monday through Friday	Horaires de disponibilité : Lundi - Vendredi, 8 h 00 - 20 h 00

united states

Telephone	(970) 635-1500
	Hours of operation: 6.00 a.m. to 6:00 p.m. MST Monday through Friday

hp support in south america

Customers in South America can contact HP on the telephone support lines listed, by country, below.

argentina

Telephone	0810 555 5520 (from within Argentina) (5411) 4778 8380 (outside Argentina)	0810 555 5520 (5411) 4778 8380
	Hours of operation: 8:30 a.m. to 7:30 p.m. Monday through Friday	Horas de atención: Lunes a Viernes de 8:30 a 19:30 h

brazil

Telephone	Great São Paulo: (11) 3747-7799 Other regions: 0800 157751	Grande São Paulo: (11) 3747-7799 Demais regiões: 0800 157751
	Hours of operation: 8:00 a.m. to 7:00 p.m. Monday through Friday	horãrio de funcionamento: Pré-vendas Televendas : 2a a 6a feira das 08 às 22h Sábado das 09 às 18h Pós-vendas: 2a a 6a feira das 08 às 19h

chile

Telephone	800 22 5547	800 22 5547
	Hours of operation: 9:00 a.m. to 6:00 p.m. Monday through Friday	Horas de atención: Lunes a Viernes de 9:00 a 18:00 h

colombia

Telephone	9 800 91477	9 800 91477
	Hours of operation: 9:00 a.m. to 6:00 p.m. Monday through Friday	Horas de atención: Lunes a Viernes de 9:00 a 18:00 h

guatemala

Telephone	800 999 5305	800 999 5305
	Hours of operation: 9:00 a.m. to 6:00 p.m. Monday through Friday Saturdays from 9:00 a.m. to 1.00 p.m.	Horas de atención: Lunes a Viernes de 9:00 a 18:00 h

mexico

Mexico City

Telephone	52-58-9922	52-58-9922
	Hours of operation: 8:30 a.m. to 22:00 p.m. Monday through Friday 9:00 a.m. to 14:00 p.m. on Saturday	Horas de atención: Lunes a Viernes de 8:30 a 22:00 h

Outside Mexico City

Telephone	01-800-472 6684	01-800-472 6684
	Hours of operation: 8:30 a.m. to 22:00 p.m. Monday through Friday 9:00 a.m. to 14:00 p.m. on Saturday	Horas de atención: Lunes a Viernes de 8:30 a 22:00 h

puerto rico

Telephone	1 877 2320 589	1 877 2320 589
	Hours of operation: 9:00 a.m. to 5:00 p.m. Monday through Friday	Horas de atención: Lunes a Viernes de 9:00 a 17:00 h

venezuela

Telephone	800 47 777 (Caracas 207 8488)	800 47 777 (Caracas 207 8488)
	Hours of operation: 8:00 a.m. to 5:00 p.m. Monday through Friday	Horas de atención: Lunes a Viernes de 8:00 a 19:00 h

how to contact hp

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  - norway
  - poland
  - portugal
  - russian federation (moscow)
  - russian federation (st petersburg)
  - russian federation (ukraine)
  - south africa (inside RSA)
  - south africa (outside RSA)
  - spain
  - sweden
  - switzerland
  - turkey
  - united arab emirates
  - united kingdom
  - other european countries - english

check the web for up to date information

If you have internet access, click on the URL below:

http://www.hp.com/cposupport/mail_support.html

From time to time, telephone numbers and addresses may change; accessing contact details over the web will ensure you have the latest information.

If you do not have internet access, refer below for a list of contact numbers correct at time of printing:

hp support in europe, middle east & africa

There is no charge for technical support during the warranty period (unless otherwise stated). A per-incident charge applies after the warranty period.

Customers in Europe, the Middle East and Africa can contact HP on the telephone support lines listed, by country, below.

austria

Telephone	+43 (0)810 00 6080 Hours of operation: 8:30 to 18:00 Monday through Friday	+43 (0)810 00 6080 Geschäftszeiten: Montag - Freitag, 08.30 - 18.00 Uhr

belgium (dutch)

Telephone	+32 (0)2 626 88 06 Hours of operation: 8:00 to 18:00 Monday through Thursday

belgium (french)

Telephone	+32 (0)2 626 88 07 Hours of operation: 8:30 to 18:00 Monday through Friday	+32 (0)2 626 88 07 Horaires de disponibilité: Lundi - Vendredi , 8 h 30 - 18 h 00

czech republic

Telephone	+42 (0)2 6130 7310 Hours of operation: 8:00 to 18:00 Monday to Thursday, 8.00 to 16:30 Friday

denmark

Telephone	+45 39 29 4099 Hours of operation: 8:30 to 18:00 Monday through Friday

finland

Telephone	+358 (0)203 47 288 Hours of operation: 8:30 to 18:00 Monday through Friday

france

Telephone	+33 (0)1 43 62 34 34 Hours of operation: 8:30 to 18:00 Monday through Friday	+33 (0)1 43 62 34 34 Horaires de disponibilité: Lundi - Vendredi , 8 h 30 - 18 h 00

germany

Telephone	+49 (0)180 52 58 143 Hours of operation: 8:30 to 18:00 Monday through Friday	+49 (0)180 52 58 143 Geschäftszeiten: Montag - Freitag, 08.30 - 18.00 Uhr

greece

Telephone	+30 (0)1 619 64 11 Hours of operation: 9:00 to 17:00 Monday through Friday

hungary

Telephone	+36 (0)1 382 1111 Hours of operation: 8:30 to 18:00 Monday through Friday

ireland

Telephone	+353 (0)1 662 5525 Hours of operation: 8:30 to 18:00 Monday through Friday

israel

Telephone	+972 (0)9 952 4848 Hours of operation: 9:00 to 18:00 Sunday through Thursday

italy

Telephone	+39 (0)2 264 10350 Hours of operation: 8:30 to 18:00 Monday through Friday	+39 02 264 10350 Orario d'apertura: Lunedì-Venerdì, 8:30 - 18:00

netherlands

Telephone	+31 (0)20 606 8751 Hours of operation: 8:30 to 18:00 Monday through Friday

norway

Telephone	+47 22 11 6299 Hours of operation: 8:30 to 18:00 Monday through Friday

poland

Telephone	+48 22 519 06 00 Hours of operation: 8:00 to 17:00 Monday through Friday

portugal

Telephone	+351 21 317 6333 Hours of operation: 8:30 to 18:00 Monday through Friday	+351 21 317 6333 Horário de operação: Segunda - Sexta, 8:30 - 17:00

russian federation (moscow)

Telephone	+7 095 797 3520 Hours of operation: 9:00 to 18:00 Monday through Friday

russian federation (st petersburg)

Telephone	+7 812 346 7997 Hours of operation: 9:00 to 18:00 Monday through Friday

russian federation (ukraine)

Telephone	+7 (380-44) 490-3520 Hours of operation: 9:00 to 18:00 Monday through Friday

south africa (inside RSA)

Telephone	086 000 1030 Hours of operation: 8:00 to 17:00 Monday through Friday

south africa (outside RSA)

Telephone	+27-11 258 9301 Hours of operation: 8:00 to 17:00 Monday through Friday

spain

Telephone	+34 902 321 123 Hours of operation: 8:30 to 18:00 Monday through Friday	+34 902 321 123 Horas de atención: Lunes a Viernes de 8:30 a 18:00 h

sweden

Telephone	+46 (0) 8 619 2170 Hours of operation: 8:30 to 18:00 Monday through Friday

switzerland

Telephone	+41 (0) 848 80 11 11 Hours of operation: 8:30 to 18:00 Monday through Friday

turkey

Telephone	+90 (0)212 221 69 69 Hours of operation: 8:30 to 18:00 Monday through Friday

united arab emirates

Telephone	971 4 883 8454 Hours of operation: 8:30 to 18:00 Monday through Friday For customers in: UAE, Bahrain, Qatar, Saudi Arabia, Jordan, Palestine, Egypt, Yemen, Lebanon, Kuwait and Oman (languages supported - English and Arabic)

united kingdom

Telephone	+44 (0)207 512 52 02 Hours of operation: 8:30 to 18:00 Monday through Friday

other european countries (english)

Telephone	+44 (0)207 512 52 02 Hours of operation: 8:30 to 18:00 Monday through Friday

how to contact hp

data protection

- contact hp
- americas
- europe
- asia pacific
- warranty
- customer service form

asia pacific

contents of this section

- check the web for up to date contact information
- hp support in asia pacific
  - australia
  - china (PRC)
  - hong kong
  - india
  - indonesia
  - japan
  - korea, republic of
  - malaysia
  - new zealand
  - philippines
  - singapore
  - taiwan
  - thailand
  - vietnam

check the web for up to date information

If you have internet access, click on the URL below:

http://www.hp.com/cposupport/mail_support.html

From time to time, telephone numbers and addresses may change; accessing contact details over the web will ensure you have the latest information.

If you do not have internet access, refer below for a list of contact numbers correct at time of printing:

hp support in asia pacific

Customers in Asia Pacific region can contact HP on the telephone support lines listed, by country, below.

australia

Telephone (03) 8877 8000

Hours of operation: 9.00 a.m. to 5:00 p.m.
Monday through Friday

Spare parts 1800 670 054
Hours of operation: 9:00 a.m. to 5:00 p.m.
Monday through Friday

china (PRC)

Telephone +86 (0)10 6564 5959

Hours of operation: 8:30 to 17:30
Monday through Friday

hong kong

Telephone 800 96 7729

Hours of operation: 8:30 to 17:30
Monday through Friday

india

Telephone +91 11 682 6035

Hours of operation: 9:30 a.m to 5:30 p.m
Monday through Friday

indonesia

Telephone +62 (21) 350 3408

Hours of operation: 8:00 a.m to 5:00 p.m.
Monday through Friday

japan

Telephone +81 3 3335 8333

Hours of operation: 9:00 to 12:00 and 13.00 to 17:00
Monday through Friday

korea, rupublic of

within Seoul only

Telephone +82 (2) 3270 0700

Hours of operation: 9:00 a.m. to 6:00 p.m.
Monday through Friday.

9:00 a.m. to 1:00 p.m on Saturdays

outside Seoul only

Telephone 080 999 0700
Hours of operation: 9:00 a.m. to 6:00 p.m.
Monday through Friday.

9:00 a.m. to 1:00 p.m on Saturdays

malaysia

Telephone +60 (3) 295 2566

Hours of operation: 8:30 a.m. to 5:30 p.m.
Monday through Friday

new zealand

Telephone +64 (9) 356 6640

Hours of operation: 9:00 a.m. to 5:30 p.m.
Monday through Friday

philippines

Telephone +63 (2) 867 3351

Hours of operation: 8:30 a.m. to 5:30 p.m.
Monday through Friday

singapore

Telephone +65 272 5300

Hours of operation: 8:30 a.m. to 5:30 p.m
Monday through Friday

taiwan

Telephone +886 (2) 2717 0055

Hours of operation: 8:30 a.m. to 5:30 p.m.
Monday through Friday

thailand

Telephone +66 (2) 661 4000

Hours of operation: 8:30 a.m. to 5:30 p.m.
Monday through Friday

vietnam

Telephone +84 (0) 8823 4530

Hours of operation: 8:00 a.m. to 5:00 p.m.
Monday through Friday

8.00 a.m to 12:00 p.m on Saturday

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warranty

contents of this section

- warranty conditions
  - exclusions
  - limitations
- limited warranty statement for USA, Canada, Australia and New Zealand

warranty conditions

This warranty gives you specific legal rights. You may also have other rights which vary according to where you are located.

Hewlett-Packard warrants its Surestore tape drives against defects in materials and workmanship for a period of three years, either from the date of delivery or, where the purchase price includes installation by Hewlett-Packard, from the date of installation. If a new HP Surestore tape drive is purchased as a component of an HP computer system, the tape drive warranty is automatically upgraded to the system warranty.

You are entitled to:

- automatic three-year, next day unit exchange
- system matching warranty on HP systems (internal, external and removable units), when purchased as a component of that system. The system matching period is applicable for the period of the host system standard warranty only. The tape drive warranty reverts to unit exchange for the remainder of its standard warranty, if applicable, after the host warranty expires.
- free technical call center assistance during the product support life (does not include telephone call cost)

Further information is available via the web at: www.hp.com/support/tapewarranty

During the first three years, the unit exchange program (not available in all countries) allows you to receive a replacement unit by next-day delivery upon verification of a faulty tape drive. Hewlett-Packard will, at its option, either repair or replace products that prove to be defective. Should Hewlett-Packard be unable to repair or replace the product within a reasonable period of time, a refund of the purchase price may be given upon return of the product.

If you choose not to use unit exchange, your HP Surestore tape drive must be serviced by one of the authorized repair depots within the country in which it was originally purchased. You must prepay shipping charges (together with all duty and taxes) for products returned for service. Except for products returned to you from another country, Hewlett-Packard will pay for return of products to you. If the drive is repaired by an authorized dealer, you will need to negotiate the method and cost of returning the drive with the dealer.

exclusions

The warranty on your HP SureStore tape drive does not apply to defects resulting from:

- improper or inadequate maintenance by the customer
- Customer-supplied software or interfaces
- Unauthorized modification or misuse
- Use of unsupported media
- Operation outside the environmental specifications for the product
- Improper site preparation and maintenance

limitations

Any implied warranty of merchantability or fitness is limited to the three-year duration of this written warranty. Some states or provinces do not allow limitations on how long an implied warranty lasts, so limitations or exclusions may not apply to you.

limited warranty statement for USA, Canada, Australia and New Zealand

HP warrants to you, the end-user customer, that HP hardware, accessories and supplies will be free from defects in materials and workmanship after the date of purchase, for the period specified above. If HP receives notice of such defects during the warranty period, HP will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

1. HP warrants to you that HP software will not fail to execute its programming instructions after the date of purchase, for the period specified above, due to defects in material and workmanship when properly installed and used. If HP receives notice of such defects during the warranty period, HP will replace software media which does not execute its programming instructions due to such defects.
2. HP does not warrant that the operation of HP products will be uninterrupted or error free. If HP is unable, within a reasonable time, to repair or replace any product to a condition as warranted, you will be entitled to a refund of the purchase price upon prompt return of the product.
3. HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.
4. Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by HP, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.
5. HP MAKES NO OTHER EXPRESS WARRANTY OR CONDITION WHETHER WRITTEN OR ORAL. TO THE EXTENT ALLOWED BY LOCAL LAW, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY SET FORTH ABOVE. Some countries, states or provinces do not allow limitations on the duration of an implied warranty, so the above limitation or exclusion might not apply to you. This warranty gives you specific legal rights and you might also have other rights that vary from country to country, state to state, or province to province.
6. TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE YOUR SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL HP OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE. Some countries, states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

Consumer Warranty Sept 16/97

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customer service form

contents of this section

- contact information
- tape drive information
- computer system information
- SCSI bus configuration
- backup information
- information about the problem

Please complete the following information about your system and the problem you are having before you call the HP Customer Support Center. You can print this form and fill in the necessary information before you call, or you can print and fax the completed form to the Customer Service Center.

contact information

Company or Organization:

Contact Person/Title:
(e.g., Mr. John Smith,
Network Administrator)

Contact Telephone Number:

Fax Number:

E-Mail Address:

Mailing Address:

tape drive information

Model Name:
(example:
HP Surestore Ultrium 230i)

Model Number:
(example: HP C1555B)

Serial Number:

Firmware Revision:

Date Purchased:

Date of Last Cleaning:

How many times has cleaning tape been used?

computer system information

Computer Make and Model:
(example:
HP NetServer E-series)

Processor and Clock Speed:
(example: Pentium 550)

Amount of RAM:
(example: 64 MB)

Number of SCSI Controllers:

Computer Operating System/Release
(example:
Novell NetWare 4.0, Windows NT 3.51, HP-UX 10.0)

Operating System Patches Installed:
(example: Service Pack 4)

Number of Hard Disks/Size/Partitions:
(example:
Disk 1: 1.2 GB, 1 partition
Disk 2: 1.8 GB, 2 partitions)

Logical or Physical Mapping of Disks:
(example:
Disk 1 = C:/, Disk 2 = S:/)

SCSI bus configuration

Host Adapter Make and Model
(example:
Adaptec AHA-2940)

SCSI bus
(narrow or wide)

SCSI ID	Device	Termination	Internal / External	Devices' Bus Type
..	....	....	....	....
..	....	....	....	....
..	....	....	....	....
..	....	....	....	....
..	....	....	....	....
..	....	....	....	....
..	....	....	....	....
7	SCSI Controller	....	....	....

EXAMPLE

SCSI ID	Device	Termination	Internal / External	Devices' Bus Type
0	Hard disk	No	Internal	Narrow / Single-ended
1	CD-ROM	No	Internal	Narrow / Single-ended
3	Tape Drive (HP C1533A)	No	Internal	Narrow / Single-ended
5	Tape Drive (DLT7000)	Yes	External	Wide / Single-ended
7	SCSI Controller	Automatic	HBA	Wide / Single-ended

backup information

Backup Application Name and Version or Release:

Are you using HP One Button Disaster Recovery?

Do you back up user data only?

Do you back up system information separately?
(example:
Windows registry files,
NetWare NDS or bindery files)

information about the problem

Light Pattern During Problem:

Any Audible Signals:

Error Messages/Code Generated:

Does the problem occur every time you try the operation?

Does the problem occur if you use another backup device?

What type of media are you using?
(Brand, Capacity, Batch No.)

Can you read the problem tape cartridge on another drive?

What result do you get when you try a new cartridge?

If you have an autoloader, are all cartridges affected the same way?

Have you run any kind of diagnostics program, such as TapeAssure? What result was reported?

Detailed Description of Problem:

Artisan
Technology Group

Artisan Technology Group is your source for quality new and certified-used/pre-owned equipment

- FAST SHIPPING AND DELIVERY
- TENS OF THOUSANDS OF IN-STOCK ITEMS
- EQUIPMENT DEMOS
- HUNDREDS OF MANUFACTURERS SUPPORTED
- LEASING/MONTHLY RENTALS
- ITAR CERTIFIED SECURE ASSET SOLUTIONS

SERVICE CENTER REPAIRS

Experienced engineers and technicians on staff at our full-service, in-house repair center

InstraView℠ REMOTE INSPECTION

Remotely inspect equipment before purchasing with our interactive website at ***www.instraview.com*** ↗

WE BUY USED EQUIPMENT

Sell your excess, underutilized, and idle used equipment
We also offer credit for buy-backs and trade-ins
www.artisantg.com/WeBuyEquipment ↗

LOOKING FOR MORE INFORMATION?

Visit us on the web at ***www.artisantg.com*** ↗ for more information on price quotations, drivers, technical specifications, manuals, and documentation

Contact us: (888) 88-SOURCE | sales@artisantg.com | www.artisantg.com